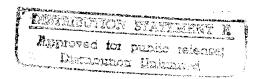
United States Air Force 611th Air Support Group/ Civil Engineering Squadron

Elmendorf AFB, Alaska

Final

Remedial Investigation and Feasiblity Study

Point Lay Radar Installation, Alaska



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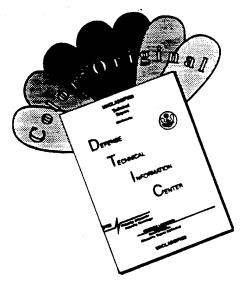
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PREFACE

This report presents the findings of Remedial Investigations and Feasiblity Studies at sites located at the Point Lay radar installation in northern Alaska. The sites were characterized based on sampling and analyses conducted during Remedial Investigation activities performed during August and September 1993. This report was prepared by ICF Technology Incorporated.

This report was prepared between May 1995 and March 1996. Mr. Samer Karmi of the Air Force Center for Environmental Excellence was the Alaska Restoration Team Chief for this task. Dr. Jerome Madden and Mr. Richard Borsetti of the 611th CES/CEVR were Remedial Project Managers for this project.

Approved:

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Program Director
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NOTICE

This report has been prepared for the United States Air Force (Air Force) by ICF Technology Incorporated for the purpose of aiding in the implementation of final remedial actions under the Air Force Installation Restoration Program (IRP). As the report relates to actual or possible releases of potentially hazardous substances, its release prior to an Air Force final decision on remedial action may be in the public's interest. The limited objectives of this report and the ongoing nature of the IRP, along with the evolving knowledge of site conditions and chemical effects on the environment and health, must be considered when evaluating this report, since subsequent facts may become known which may make this report premature or inaccurate. Acceptance does not mean that the United States Air Force adopts the conclusions, recommendations or other views expressed herein, which are those of the contractor only and do not necessarily reflect the official position of the United States Air Force.

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TABLE OF CONTENTS

EXE	ECUTIVE S	SUMMARY ES	i-1
1.0	INTRODU		-1
	1.1	THE UNITED STATES AIR FORCE INSTALLATION RESTORATION	
			-1
	1.2		-3
		, , ,	-4
		,	-4
		.	-4
		3 0,	-4
		1.2.3.2 Local Geology	
		1.2.4 Hydrology	
		1.2.4.1 Ground Water/Permafrost 1-	
		1.2.4.2 Surface Water	
		1.2.5 Industrial Activities 1-2	
		1.2.6 Biology	
		1.2.6.1 Vegetation	
		1.2.6.2 Fishes	
		1.2.6.3 Birds	
		1.2.6.4 Mammals	
		1.2.6.5 Threatened and Endangered Species 1-2	
		1.2.7 Demographics	

		1.2.7.2 Cultural Resources	
	1.3	SITE INVENTORY	
	1.0	1.3.1 Sites at Point Lay	
		1.3.2 Previous IRP Activities	
		1.3.3 Previous Remedial Actions	
		1.0.0 Fromodo Homodia Addono III. III. III. III. III. III. III. I	
2.0	PROJECT	T ACTIVITIES	2-1
		PROJECT OBJECTIVES AND SCOPE	
	2.2		2-1
			2-2
		- The state of the	2-3
		-	2-3
	2.3		2-7
		2.3.1 Sampling Procedures	2-7
		2.3.2 Summary of RI Sampling	2-7
		· · · · · · · · · · · · · · · · · · ·	2-8
		2.3.2.2 Background Sampling and Analyses	2-8
		2.3.3 Laboratory Analyses	
		2.3.3.1 Analytical Program 2-	25

		2.3.4	Chronolog	gy of Laboratory Analyses	2-26
		2.3.5	Laborator	y QA/QC Programs	2-26
		2.3.6	Data Valid	dation and Reporting	2-27
	2.4	METH	ODOLOGY	FOR RISK ESTIMATION	2-28
		2.4.1		ealth Risk	
		2.4.2		ıl Risk	
		2.4.3	Contamin	ant Fate and Transport	2-34
		2.4.4	General N	Aigration Pathways	2-34
			2.4.4.1	Topography	2-34
			2.4.4.2	Stratigraphy	2-41
			2.4.4.3	Subsurface Migration	2-41
			2.4.4.4	Surface Migration	2-42
			2.4.4.5	Air Transport	2-45
		2.4.5		S	2-45
		2.4.0	ricooptor		
3 N	DEMEDIA	71 IVIVE	STIGATIO	N - REMEDIAL ACTION SITES	3-1
5.0	3.1			ANDFILL (LF01)	
	5.1	3.1.1	Site Back	ground	3-1
		3.1.2		pling and Analytical Results	
		0.1.2	3.1.2.1	Summary of Samples Collected	3-2
			3.1.2.2	Analytical Results	
			3.1.2.3	Summary of Site Contamination	
		3.1.3		Pathways	
		3.1.3	3.1.3.1	Topography and Stratigraphy	
			3.1.3.2	Migration Potential	
			3.1.3.3	Receptors and Chemical Concentrations at Receptors .	
		3.1.4		lealth Risk Assessment	
		3.1.4	3.1.4.1	Chemicals of Concern	
			3.1.4.2	Exposure Pathways and Potential Receptors	
			3.1.4.2	Risk Characterization	
			3.1.4.4	Summary of Human Health Risk Assessment	
		3.1.5		al Risk Assessment	3-7
		3.1.5	3.1.5.1	Chemicals of Concern	
			3.1.5.1	Summary of Ecological Risk Assessment	
		016		ons and Recommendations	
	2.0	3.1.6			
	3.2	3.2.1	GE (3300)	kground	
		3.2.1	Side Dacr	npling and Analytical Results	
		3.2.2	3.2.2.1	Summary of Samples Collected	
			3.2.2.1	Analytical Results	
			3.2.2.2 3.2.2.3	Summary of Site Contamination	
		202		Pathways	
		3.2.3	•	Topography and Stratigraphy	
			3.2.3.1	Topography and onaugraphy	

		3.2.3.2	Migration Potential	3-31
		3.2.3.3	Receptors and Chemical Concentrations at Receptors .	3-32
	3.2.4	Human H	Health Risk Assessment	3-32
		3.2.4.1	Chemicals of Concern	3-33
		3.2.4.2	Exposure Pathways and Potential Receptors	3-33
		3.2.4.3	Risk Characterization	3-33
		3.2.4.4	Summary of Human Health Risk Assessment	
	3.2.5	Ecologic	al Risk Assessment	3-34
		3.2.5.1	Chemicals of Concern	3-34
		3.2.5.2	Summary of Ecological Risk Assessment	3-35
	3.2.6	Conclusi	ons and Recommendations	
3.3	DRAIN	AGE PAT	HWAY FROM POL TANKS (SS07)	3-55
	3.3.1		kground	
	3.3.2		mpling and Analytical Results	
		3.3.2.1	Summary of Samples Collected	
		3.3.2.2	Analytical Results	3-55
		3.3.2.3	Summary of Site Contamination	3-56
	3.3.3	Migration	n Pathways	3-56
		3.3.3.1	Topography and Stratigraphy	3-56
		3.3.3.2	Migration Potential	3-57
		3.3.3.3	Receptors and Chemical Concentrations at Receptors .	3-57
	3.3.4	Human I	Health Risk Assessment	3-58
		3.3.4.1	Chemicals of Concern	3-58
		3.3.4.2	Exposure Pathways and Potential Receptors	3-59
		3.3.4.3	Risk Characterization	3-59
	3.3.5	Ecologic	al Risk Assessment	3-60
		3.3.5.1	Chemicals of Concern	3-60
		3.3.5.2	Summary of Ecological Risk Assessment	3-60
	3.3.6	Conclus	ions and Recommendations	3-60
3.4	CRUS	HED DRU	IM AREA (SS08)	3-71
	3.4.1	Site Bac	kground	3-71
	3.4.2	Field Sa	mpling and Analytical Results	3-71
		3.4.2.1	Summary of Samples Collected	
		3.4.2.2	Analytical Results	
		3.4.2.3	Summary of Site Contamination	3-72
	3.4.3	Migratio	n Pathways	3-72
		3.4.3.1	Topography and Stratigraphy	3-73
		3.4.3.2	Migration Potential	3-73
		3.4.3.3	Receptors and Chemical Concentrations at Receptors	
	3.4.4	Human	Health Risk Assessment	
		3.4.4.1	Chemicals of Concern	
		3.4.4.2	Exposure Pathways and Potential Receptors	
		3.4.4.3	Risk Characterization	. 3-75

		3.4.5	Ecological Risk Assessment	3-76
			3.4.5.1 Chemicals of Concern	3-76
			3.4.5.2 Summary of Ecological Risk Assessment	3-77
		3.4.6	Conclusions and Recommendations	3-77
				4-1
4.0	FEASIBIL	ITY STL	JDY	4-1 4-1
		4.0.1	Approach To Feasibility Study	
		4.0.2	Risk Management Decisions	4-2
		4.0.3	Organization	4-3
	4.1	SITE C	CHARACTERIZATION FOR REMEDIATION	4-3
		4.1.1	Summary of Site Information	4-4
		4.1.2	Estimated Areas, Volumes, and Masses of Contaminated Media	4-4
		4.1.3	ARARs	4-4
	4.2	SCRE	ENING OF GENERAL RESPONSE ACTIONS	4-15
		4.2.1	Presentation and Screening of General Response Actions	4-15
			4.2.1.1 Screening of GRAs for Soil, Drums, and Debris	4-18
			4.2.1.2 Screening of GRAs for Soil Beneath Buildings and	
			Associated Gravel	4-18
			4.2.1.3 Screening of GRAs for Contaminated Tundra	4-18
		4.2.2	Presentation of Technologies	4-18
			4.2.2.1 No Action	4-23
			4.2.2.2 Institutional Controls and Monitoring	4-23
			4.2.2.3 Containment by Maintenance of Freezing Conditions	
			(Containment)	4-23
			4.2.2.4 Thermal Desorption	4-23
			4.2.2.5 Enhanced Bioremediation	4-24
			4.2.2.6 Biosurfactants	4-24
			4.2.2.7 Offsite Incineration	4-29
	4.3	DEVE	LOPMENT OF REMEDIAL ALTERNATIVES	4-29
		4.3.1	Approach to Developing Remedial Alternatives	4-29
			4.3.1.1 No Action	4-29 4-33
			4.3.1.2 Institutional Controls and Monitoring	4-33 4-34
			4.3.1.3 Containment	
			4.3.1.4 Enhanced Bioremediation	4-35
			4.3.1.5 Biosurfactants	
			4.3.1.6 Thermal Desorption	
			4.3.1.7 Offsite Incineration	
	4.4	DETA	ILED EVALUATION OF REMEDIAL ALTERNATIVES	4-36
		4.4.1	Approach	4-30
			4.4.1.1 Successful Application Of The Technology Under Site	4-36
			Conditions	
			4.4.1.2 Total Project Cost	
			4 4 1 3 Contaminant Reduction	4-30

		4.4.1.4 Project Duration	4-37
		4.4.1.5 Data Gaps	4-41
	4.4.2	Detailed Evaluation of Alternatives for Soil, Drums, and Debris;	
		Soil Beneath Buildings; and Tundra	4-41
		4.4.2.1 Soil, Drums, and Debris	4-41
		4.4.2.2 Soil Beneath Buildings and Associated Gravel	4-42
		4.4.2.3 Tundra	4-48
	4.4.3	Summary of Detailed Evaluation of Remedial Alternatives	4-49
	4.4.4	Summary of the Nine Criteria	4-55
	4.4.5	Preferred Alternatives	4-61
4.5	SITING	3 STUDY	4-63

APPENDICES

- A. REFERENCES AND LIST OF ACRONYMS, ABBREVIATIONS, AND UNITS OF MEASUREMENT
- B. PHOTOGRAPHS OF POINT LAY RADAR INSTALLATION AND SITES
- C. COPY OF THE TASK DESCRIPTIONS/STATEMENT OF WORK
- D. SAMPLE COLLECTION LOGS
- E. CHAIN-OF-CUSTODY FORMS
- F. ANALYTICAL DATA
- G. DATA VALIDATION SUMMARIES

LIST OF TABLES

1-1.	KNOWN CULTURAL RESOURCE SITES IN THE VICINITY OF POINT LAY	
	RADAR INSTALLATION	1-27
2-1.	SUMMARY OF POINT LAY REMEDIAL INVESTIGATION FIELD SAMPLING	
	ACTIVITIES	2-8
2-2.	SUMMARY OF SAMPLING AND ANALYSES CONDUCTED FOR POINT LAY	
	REMEDIAL INVESTIGATIONS	2-9
2-3.	BACKGROUND ANALYTICAL DATA SUMMARY	2-12
2-4.	ANALYTICAL METHODS AND TOTAL NUMBER OF SOIL ANALYSES	2-23
2-5.	ANALYTICAL METHODS AND TOTAL NUMBER OF WATER ANALYSES	2-24
2-6.	REPRESENTATIVE SPECIES AT THE DEW LINE INSTALLATION SITES	2-33
2 0. 3-1.	DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY	3-11
3-1. 3-2.	IDENTIFICATION OF CHEMICALS OF CONCERN AT THE DEACTIVATED	
3-∠ .	LANDFILL (LF01)	3-26
0.0	GARAGE ANALYTICAL DATA SUMMARY	3-39
3-3.	IDENTIFICATION OF CHEMICALS OF CONCERN AT THE GARAGE (SS06)	3-53
3-4.	DRAINAGE PATHWAY FROM POL TANKS ANALYTICAL DATA SUMMARY	3-65
3-5.	DHAINAGE PATHWAY FROM POL TANKS ANALYTICAL DATA COMMINING.	0.00
3-6.	IDENTIFICATION OF CHEMICALS OF CONCERN AT THE DRAINAGE	3-70
	PATHWAY FROM POL TANKS (SS07)	
3-7.	CHUSHED DRUM AREA ANALYTICAL DATA SUMMANT	0-01
3-8.	IDENTIFICATION OF CHEMICALS OF CONCERN AT THE CRUSHED DRUM	3-93
	AREA (SS08)	0-50
4-1.		4-5
	(LF01)	4-6
4-2.	REMEDIAL ACTION CHARACTERIZATION FOR THE GARAGE (\$\$06)	7-0
4-3.	REMEDIAL ACTION CHARACTERIZATION FOR THE CRUSHED DRUM AREA	4-7
	(SS08) MEDIA	4-7
4-4.	APPROXIMATE AREAS, VOLUMES, AND MASSES OF CONTAMINATED MEDIA	4-15
	BY SITE AT POINT LAY	
4-5.	ARARS FOR SITES AT THE POINT LAY INSTALLATION	4-10
4-6.	SCREENING OF GENERAL RESPONSE ACTIONS FOR REMEDIAL	
	ALTERNATIVES EVALUATED FOR THE SOIL, DRUMS, AND DEBRIS AT	4-19
	DEACTIVATED LANDFILL (LF01)	4-18
4-7.	SCREENING OF GENERAL RESPONSE ACTIONS FOR REMEDIAL	
	ALTERNATIVES EVALUATED FOR SOIL BENEATH BUILDINGS AND	4-20
	ASSOCIATED GRAVEL	4-20
4-8.	SCREENING OF GENERAL RESPONSE ACTIONS FOR REMEDIAL	4.04
	ALTERNATIVES EVALUATED FOR TUNDRA	4-21
4-9.	SUMMARY OF REMEDIAL ALTERNATIVES BY MEDIUM	4-33
4-10.	SUMMARY OF PROJECT COSTS FOR REMEDIAL ALTERNATIVE EVALUATED	
	FOR THE SOIL, DRUMS, AND DEBRIS AT THE DEACTIVATED LANDFILL	
	(LF01)	4-43

LIST OF TABLES (CONTINUED)

4-11.		
	EVALUATED FOR THE SOILS DRUMS, AND DEBRIS AT THE DEACTIVATED	
	LANDFILL (LF01)	4-44
4-12.	ESTIMATED PROJECT DURATION FOR REMEDIAL ALTERNATIVES	
	EVALUATED FOR THE SOIL, DRUMS, AND DEBRIS AT THE DEACTIVATED	
	LANDFILL (LF01)	4-44
4-13.	SUMMARY OF PROJECT COSTS FOR REMEDIAL ALTERNATIVE EVALUATED	
	FOR SOIL BENEATH BUILDINGS AND ASSOCIATED GRAVEL	4-46
4-14.	ESTIMATED CONTAMINANT REDUCTION FOR SOIL BENEATH BUILDINGS	
	AND ASSOCIATED GRAVEL	4-47
4-15.	ESTIMATED PROJECT DURATION FOR REMEDIAL ALTERNATIVES	
	EVALUATED FOR SOIL BENEATH BUILDINGS AND ASSOCIATED GRAVEL	4-48
4-16.	SUMMARY OF PROJECT COSTS FOR REMEDIAL ALTERNATIVES EVALUATED	
	FOR TUNDRA	4-50
4-17.	ESTIMATED CONTAMINANT REDUCTION FOR TUNDRA	4-51
4-18.	ESTIMATED PROJECT DURATION FOR REMEDIAL ALTERNATIVES	
	EVALUATED FOR TUNDRA	4-51
4-19.	SUMMARY OF REMEDIAL ALTERNATIVES EVALUATED FOR THE	
	DEACTIVATED LANDFILL (LF01)	4-52
4-20.	SUMMARY OF REMEDIAL ALTERNATIVES EVALUATED FOR SOILS BENEATH	
	BUILDINGS AND ASSOCIATED GRAVEL	4-53
4-21.	SUMMARY OF REMEDIAL ALTERNATIVES EVALUATED FOR TUNDRA	4-54
4-22.	EVALUATION OF NINE CRITERIA FOR THE DEACTIVATED LANDFILL (LF01)	4-56
4-23.	EVALUATION OF NINE CRITERIA FOR SOIL BENEATH BUILDINGS AND	
	ASSOCIATED GRAVEL AT THE GARAGE (SS06) AND CRUSHED DRUM AREA	
	(SS08)	4-58
4-24.	EVALUATION OF NINE CRITERIA FOR TUNDRA AT THE GARAGE (SS06) AND	
	CRUSHED DRUM AREA (SS08)	4-60
4-25.	PREFERRED REMEDIAL ACTION ALTERNATIVES	4-61

LIST OF FIGURES

1-1.	GENERAL LOCATION MAP	1-5
1-2.	AREA LOCATION MAP	
1-3.	INSTALLATION SITE PLAN	
1-4.	QUATERNARY GLACIATION IN ALASKA	1-13
1-5.	PERMAFROST MAP	1-15
1-6.	GENERALIZED NORTH-SOUTH GEOLOGIC CROSS SECTION	1-17
1-7.	SURFACE FEATURE IMPACTS ON PERMAFROST DISTRIBUTION	1-21
1-8.	SURFACE WATER DRAINAGE FEATURES	1-23
2-1.	FIELD TEAM ORGANIZATION	2-5
2-2.	BACKGROUND (BKGD) SAMPLE LOCATIONS AND ORGANIC ANALYTICAL	
	RESULTS	2-21
2-3.	POTENTIAL MIGRATION PATHWAYS	2-35
2-4.	HUMAN HEALTH RISK ASSESSMENT POTENTIAL EXPOSURE PATHWAYS	
2-5.	ECOLOGICAL RISK ASSESSMENT POTENTIAL EXPOSURE PATHWAYS	2-39
2-6.	DIKE EFFECT UNDER BERMS	2-43
3-1.	DEACTIVATED LANDFILL (LF01) SAMPLE LOCATIONS AND ANALYTICAL	
	RESULTS	3-9
3-2.	GARAGE (SS06) SAMPLE LOCATIONS AND ANALYTICAL RESULTS	3-37
3-3.	DRAINAGE PATHWAY FROM POL TANKS (SS07) SAMPLE LOCATIONS AND	
	ANALYTICAL RESULTS	3-63
3-4.	CRUSHED DRUM AREA (SS08) SAMPLE LOCATIONS AND ANALYTICAL	
	RESULTS	3-79
4-1.	LOCATIONS AND ESTIMATED VOLUMES OF CONTAMINATED MEDIA AT THE	
	DEACTIVATED LANDFILL (LF01)	4-9
4-2.	LOCATIONS AND ESTIMATED VOLUMES OF CONTAMINATED MEDIA AT THE	
	GARAGE (SS06)	4-11
4-3.	LOCATIONS AND ESTIMATED VOLUMES OF CONTAMINATED MEDIA AT THE	
	CRUSHED DRUM AREA (SS08)	4-13
4-4.	THERMAL DESORPTION AND OFFSITE INCINERATION PROCESS FLOW	
	DIAGRAM	4-25
4-5.	ENHANCED BIOREMEDIATION PROCESS FLOW DIAGRAM	
4-6.	BIOSURFACTANTS PROCESS FLOW DIAGRAM	4-31
4-7.	COMPARATIVE BIODEGRADATION OF DIESEL FUEL IN SOILS	4-39

EXECUTIVE SUMMARY

BACKGROUND

The United States Air Force (Air Force) has prepared this Remedial Investigation/Feasibility Study (RI/FS) report as part of the Installation Restoration Program (IRP) to present results of RI/FS activities at four sites at the Point Lay radar installation. The IRP provides for investigating, quantifying, and remediating environmental contamination from past waste management activities at Air Force installations throughout the United States. The IRP is a four-phase program that approximates the remedial investigation (RI) and corrective action program used by the U.S. Environmental Protection Agency (EPA) for addressing contaminated sites that may pose a risk to human health or the environment.

The Air Force initiated IRP activities at the Point Lay radar installation in 1980 in response to the Department of Defense's (DOD's) commitment to identify past waste disposal sites and eliminate hazards to public health. The initial Phase I conducted by the Air Force concluded that past waste management activities at the installation may have resulted in adverse environmental impacts at several sites (CH2M Hill 1981).

In 1986, the Air Force initiated Phase II activities designed to confirm and quantify the nature and extent of environmental impairment identified during Phase I. Phase II activities involved limited field investigations of specific sites that were identified in the Phase I Installation Assessment/Record Search activities (Dames and Moore 1986,1987).

The Air Force's IRP Decision Document for Point Lay of 1989 (Woodward-Clyde 1989) concluded that no further action was needed at the four Point Lay sites. However, correspondence from Alaska Department of Environmental Conservation (ADEC) personnel to Air Force personnel in November 1991 (ADEC 1991) disagreed with the no further action conclusion. The correspondence stated that further investigation was needed and that corrective action appeared necessary because of improper waste disposal practices and other issues.

A private contractor prepared the Environmental Assessment for the North Warning System (Alaska) in January 1987 (Hart Crowser 1987). The report discussed the impacts of retrofitting with long range radar equipment at the Point Lay DEW Line facility, also referred to as LIZ-2.

The Air Force initiated RI/FS activities at the Point Lay radar installation in the summer of 1993. During the initial scoping activities, which included record searches, personnel interviews, and physical inspection of the installation, the Air Force and ADEC personnel concluded that four sites warranted investigation under the IRP. The four sites included several of the previously identified and investigated sites that were determined still to be of concern. This document is a detailed presentation of RI activities and provides conclusions and recommendations for addressing environmental conditions at the four Point Lay sites. Remedial actions are recommended for all four of the sites, and remedial alternatives for cleanup of these sites are evaluated in the feasibility study (FS) section of this document.

INSTALLATION DESCRIPTION

The Point Lay radar installation is located at 69°43'N, 163°00'W in the western portion of the Arctic Coastal Plain, on the east shoreline of Kasegaluk Lagoon, immediately south of the village of Point Lay (Figure 1-1, page 1-5). The installation has been active since 1955 and occupies 1,442 acres (Figure 1-2, page 1-7).

Point Lay radar installation, also known as LIZ-2, was constructed as an auxiliary station. Initially it consisted of one 24-module train, rotating radar, and support facilities. Facilities at the DEW Line station are the most prominent feature of the area. Facilities include a radome, four 30-foot communications antennas, warehouse, fuel storage tanks, hangar, 3,519-foot long weighted gravel runway, and associated gravel roads and pads.

Temperatures at the Point Lay installation are generally low throughout the year, with summer temperatures ranging from 32°F to 53°F and winter temperatures from -27°F to -5°F (Hart Crowser 1987). Precipitation at Point Lay averages 7 inches per year; snowfall is about 21 inches per year. Permafrost at the installation area is up to 1,300 feet thick. Due to the permafrost, polygonal surface patterns are abundant.

The hydrology of the installation is controlled by the relatively low topography and permafrost. Even with the low precipitation rates, the tundra is predominantly swampy. Small streams drain the several large and small lakes and swampy land occurring around the installation.

Point Lay is predominantly covered by a thin tundra mat, beneath which is a layer of sand and loess (wind blown silt) approximately two to three feet thick. Underlying these deposits are lenses and layers of marine and alluvial clay, silt, sand, and sandy gravel.

The vegetative habitat types at Point Lay support a variety of wildlife. Areas in the vicinity of the installation provide habitat important to birds, mammals, and fish.

PROJECT ACTIVITIES

The Air Force conducted RI/FS field activities at four sites at the Point Lay radar installation during 1993. The objectives of the Point Lay RI/FS are to confirm the presence or absence of chemical contamination of the environment at the installation; define the extent and magnitude of confirmed chemical releases; gather adequate data to determine the magnitude of potential risks to human health and the environment; and gather adequate data to identify and select the appropriate remedial actions for sites where apparent risks exceed acceptable limits.

The RI field activities were carried out in a three-phased approach. The three phases, installation presurvey, reconnaissance, and RI field activities, allowed contractor personnel to confirm the location of areas of environmental concern and identify sampling locations before conducting RI field activities. Four sites investigated during the RI activities include:

- Deactivated Landfill (LF01)
- Garage (SS06)

- Drainage Pathway from POL Tanks (SS07)
- Crushed Drum Area (SS08)

The site locations are shown in Figure 1-3 (page 1-9).

The RI field activities were conducted from mid-August through early September of 1993. The RI was conducted in conjunction with RIs at seven other radar installations located throughout northern Alaska. Sixteen contractor employees were stationed in Alaska for the duration of the RI. Sampling activities at the Point Lay radar installation included collection of surface and subsurface soil samples with hand tools, and collection of surface water, sediment, and landfill seep samples from drainages adjacent to potentially contaminated areas.

A total of 97 samples was collected during the 1993 RI activities at Point Lay. These included soil, sediment and surface water samples collected from the four sites as well as samples for quality assurance/quality control (QA/QC) and to establish background levels. A summary of the samples collected is presented in Table ES-1.

Analyses of samples collected during RI activities were conducted by a fixed laboratory in Anchorage, Alaska, and a temporary laboratory set up at Barrow, Alaska. Laboratory analyses conducted by the temporary laboratory were conducted on a quick turnaround basis. Analyses conducted in Anchorage, Alaska, included primarily standard turnaround but also a few quick turnaround analyses.

The Air Force conducted a risk assessment once the data had been validated and compiled. The purpose of the risk assessment was to evaluate the human and ecological health risks that may be associated with chemicals released to the environment at the sites investigated during the RI. The risk assessment characterizes the probability that measured concentrations of hazardous chemical substances will cause adverse effects in humans or the environment in the absence of remediation. The risk assessment will be used in conjunction with state and federal standards and/or guidance to determine if remediation (site cleanup) is necessary. The Point Lay Risk Assessment (U.S. Air Force 1996) was submitted under separate cover.

CHRONOLOGY OF ACTIVITIES

Project scoping documents were submitted between June and August 1993 for review by Air Force Center for Environmental Excellence (AFCEE) and regulatory agencies. These documents include the Work Plan, Sampling and Analysis Plan (SAP), Health and Safety Plan, and Community Relations Plan for seven DEW Line installations and Cape Lisburne. The installation Presurvey and the Reconnaissance trips were conducted in order to provide the information necessary to conduct the RI/FS activities. The Presurvey was conducted in May 1993 by a small group of contractor employees accompanied by Air Force representatives.

The Reconnaissance trip was completed in June 1993 by contractor employees, and AFCEE and ADEC representatives. RI field activities were conducted from mid-August through early September 1993. Sampling was conducted from the areas of least contamination to areas of increasing contamination. The sequence of sampling from least to most contaminated was

TABLE ES-1. SUMMARY OF REMEDIAL INVESTIGATION SAMPLING

SITE	MEDIUM	NUMBER OF ENVIRONMENTAL SAMPLES
Deactivated Landfill (LF01)	Soil/Sediment	13
	Surface Water	9
Garage (SS06)	Soil/Sediment	21
	Surface Water	3
Drainage Pathway from POL	Soil/Sediment	7
Tanks (SS07)	Surface Water	6
Crushed Drum Area (SS08)	Soil/Sediment	14
	Surface Water	2
Total Environmental Samples	Soil/Sediment	60
	Surface Water	22
QA/QC SAMPLES		
Ambient Condition Blanks	Water	1
Equipment Blanks	Water	3
Trip Blanks	Water	3
Replicates/Duplicates	Soil/Sediment	6
	Surface Water	2
Total Samples	Soil/Sediment	66
	Surface Water	31

based on previous sampling data, field screening, and visual observations. Field screening was used to assist in determining the areal extent of contamination and sampling locations. Where quick turnaround sample analyses indicated information gaps about the areal extent of contamination, or exposure point concentrations for potentially exposed populations were not defined, a second round of samples was collected and analyzed.

SUMMARY OF REMEDIAL INVESTIGATION/FEASIBILITY STUDY

The following paragraphs describe RI activities conducted at the four sites that are the focus of this report and summarizes the findings of the RI. Summaries of human health and ecological risks posed by chemicals detected at each site are included. The remedial alternatives are presented for the sites recommended for cleanup. The evaluation of remedial alternatives is presented in the FS, Section 4.0.

Deactivated Landfill (LF01). The Deactivated Landfill (LF01) site is located southeast of the hangar. It was the installation landfill from approximately 1973 to 1987. At the time of closure, the area was cleared of major surface debris, graded, covered with gravel, and seeded with grass. A small seasonal stream appears to be eroding the landfill cover, exposing rusty drums and landfill debris. Standing water along the landfill's western edge and surface runoff from the gravel pad area south of the hangar are possible source areas for the small stream. The water downstream from the landfill showed minor discoloration and biogenic sheen.

Sampling and analyses have determined that the Deactivated Landfill (LF01) site is contaminated with petroleum compounds and volatile organic compounds (VOCs). The contaminated media at the site include surface water, soil/sediment, and landfill debris south of the hangar. The source of contamination is suspected to be buried garbage and debris from previous waste disposal practices. The landfill has been inactive since 1987.

Migration of contaminants from the site appears to have been occurring. Affected media is estimated to be approximately 5,625 square feet of landfill material and associated soil cover. Surface water drainage is eroding into the landfill materials, and analytical data suggest that migration of contaminants is occurring.

The risk assessment concluded that risks posed to human health and ecological receptors by site contaminants are minimal given current or future site uses. A low potential noncancer hazard was identified due to chemicals of concern (COCs) in surface water, primarily manganese; however, all the risks and hazards are based on a conservative future scenario and are not of a magnitude that requires remedial action.

Levels of diesel range petroleum hydrocarbons (DRPH), gasoline range petroleum hydrocarbons (GRPH), and VOCs detected in site surface water do exceed ADEC guidance cleanup levels, and migration of contaminants has occurred. Therefore, the site is being recommended for remedial action. The source area at the site consists of approximately 5,625 square feet (625 cubic yards) of landfill debris and soil. The remedial action alternative recommended for the site is offsite incineration. A complete description and evaluation of the remedial alternatives considered for this site are presented in the FS, Section 4.0.

Garage (SS06). The Garage (SS06) site is located approximately 250 feet north of the module train. Floor drains in this building discharged directly to the tundra beneath the structure and may have received vehicle maintenance waste. The floor drains were sealed by the Air Force in July 1993 to prevent the possibility of future release of contaminants. The Garage is an approximately 90-foot by 40-foot building elevated about 5 feet above the tundra and is surrounded by gravel on the north, east, and south sides. The building is used for vehicle maintenance and storage.

Sampling and analyses have determined that the Garage (SS06) site is contaminated with petroleum hydrocarbons [DRPH, GRPH, and residual range petroleum hydrocarbons (RRPH)], benzene, toluene, ethylbenzene, and xylene (BTEX) compounds, other VOCs that are components of diesel fuel, and solvents. The contaminated areas at the site are soil/sediment and surface water. The area beneath the Garage has the highest concentrations of affected soil. Contaminant concentrations decrease with distance from the Garage. The suspected source of contamination is petroleum, oil, and lubricant (POL) wastes previously discharged to the building floor drains.

Migration of contaminants from the site appears to have occurred via surface and subsurface pathways from the gravel pad and the area below the Garage to the surrounding gravel and tundra areas.

The risk assessment concluded that risks posed to human health and ecological receptors by site contaminants are minimal given current site uses. Under a future scenario, using the surface water in the drainage pathways from the site as a drinking water supply results in a low potential risk to human health. The human health risk, however, is not of a magnitude that requires remedial action. The ecological risk assessment (ERA) concluded that the overall potential risks presented by site contaminants are minimal. Therefore, under current and future site conditions and considering the findings of the risk assessment, remediation of the site is not necessarily warranted.

Levels of petroleum compounds (DRPH, GRPH, and RRPH) detected in soil/sediment at the site significantly exceed ADEC guidance cleanup levels. In addition, site contaminants have migrated downgradient and have impacted soil/sediment and surface water. Therefore, the site is being recommended for remedial action. The affected areas at the site include approximately 4,000 square feet beneath the building, approximately 300 square feet of gravel between the fuel tanks south of the Garage, and approximately 27,700 square feet of tundra located southwest of the Garage. The remedial action alternative recommended for the gravel between the fuel tanks, the soil beneath the building, and the tundra is enhanced bioremediation. A complete description and evaluation of the remedial alternatives recommended for this site are presented in the FS, Section 4.0.

Drainage Pathway from POL Tanks (SS07). The Drainage Pathway from POL Tanks (SS07) is located along the bluff between the fuel storage area and the Kasegaluk Lagoon. The site consists of three small streams and a beach bluff located at the edge of the gravel pad. The gravel pad area was historically a drum storage area. An ADEC representative who inspected

this site during the reconnaissance visit felt this area appeared potentially contaminated. Styrofoam and fabric debris are partially buried in some areas along the bluff at this site.

Sampling and analyses have determined that the Drainage Pathway from POL Tanks (SS07) site is contaminated with solvents and petroleum hydrocarbons (GRPH). The affected area at the site is the surface water along the bluff and at the base of the bluff. The suspected source of contamination is related to the repainting of the POL tanks approximately two weeks prior to sample collection, but may also be attributable to a drum storage area that was formerly located on the gravel pad. Because the contaminants were detected in flowing surface water, no estimate of the volume of contamination was made.

The risk assessment concluded that risks posed to human health and ecological receptors by site contaminants are minimal given current and future site uses. The potential human health risks at the site are not of a magnitude that requires remedial action. The ERA concluded that the overall potential risks presented by site contaminants are low. Therefore, under current and future site conditions and considering the findings of the risk assessment, remediation of the site is not necessarily warranted.

Solvents detected in surface water at the site exceed ADEC guidance cleanup levels and have migrated downgradient of the site. Therefore, the site is being recommended for remedial action. The affected area at the site is surface water at the beach bluff and the base of the bluff adjacent to Kasegaluk Lagoon. The remedial action alternative recommended for the site is monitoring. If contaminants continue to be detected at the site, then further investigation may be warranted. A complete description and evaluation of the remedial alternatives considered for this site are presented in the FS, Section 4.0.

Crushed Drum Area (SS08). The Crushed Drum Area (SS08) site is a gravel pad located approximately 150 feet northeast of the module train. The gravel pad slopes gently to the tundra north and east of the site and is adjacent to a drainage pathway that runs from below the east end of the module train to the south end of the gravel pad area at the site. It was determined that an investigation was warranted at this site because of the previous drum-crushing activities.

Sampling and analyses have determined that the Crushed Drum Area (SS08) site is contaminated with petroleum hydrocarbons (DRPH, GRPH, and RRPH), and volatile and semi-volatile organics, most of which are common components of diesel fuel. The affected areas at the site are the gravel adjacent to and below the west end of the module train and the tundra along the gravel pad northwest of the module train. The suspected source of contamination is previous spills and/or leaks from the day tanks in the west end of the module train.

The risk assessment concluded that risks posed to human health and ecological receptors by site contaminants are minimal given current site uses. The potential human health risks at the site are not of a magnitude that requires remedial action. The ERA concluded that the overall potential risks presented by site contaminants are low. Therefore, under current site conditions and considering the findings of the risk assessment, remediation of the site is not necessarily warranted.

Levels of petroleum compounds (primarily diesel) detected in soil/sediment at the site exceed ADEC guidance cleanup levels. In addition, site contaminants have migrated downgradient of the site, and have impacted gravel, tundra areas, and surface water. Therefore, the site is being recommended for remedial action. The affected area at the site is the gravel area below and adjacent to the west end of the module train and the tundra along the gravel pad northwest of the module train. The remedial action alternative recommended for the tundra and soil beneath the building is enhanced bioremediation. A complete description and evaluation of the remedial alternatives considered for this site are presented in the FS, Section 4.0.

CONCLUSIONS

To meet the Air Force's commitment to identify, quantify, and remediate waste disposal sites at installations throughout the United States, the prime contractor completed an RI/FS at four sites at the Point Lay radar installation. The investigation was completed in accordance with the guidelines established in the Air Force's IRP. The RI/FS involved field investigations, sampling, and analysis at four sites at the Point Lay radar installation.

Based on the RI sampling and data analyses and quantitative risk assessment, the Air Force has concluded that contaminant levels do not represent a significant potential risk to receptor populations; however, contaminant concentrations do exceed ADEC cleanup guidance levels at all four of the Point Lay sites. Therefore, it is recommended that remedial actions be conducted at the four sites. The sites include the Deactivated Landfill (LF01), Garage (SS06), Drainage Pathway from POL Tanks (SS07), and Crushed Drum Area (SS08). The remedial action alternatives recommended for these four sites are presented in Table ES-2.

TABLE ES-2. SITES RECOMMENDED FOR REMEDIAL ACTION

		,	
SITE NAME	SITE ID NUMBER	MEDIUM	RECOMMENDED REMEDIAL ALTERNATIVE
Deactivated Landfill	LF01	Soil, drums and debris	Offsite incineration
Garage	SS06	Soil beneath building and associated gravel	Enhanced bioremediation
		Tundra	Enhanced bioremediation
Drainage Pathway from POL Tanks	SS07	Tundra	Monitoring
Crushed Drum Area	SS08	Tundra	Enhanced bioremediation
		Soil beneath building	Enhanced bioremediation

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1.0 INTRODUCTION

The United States Air Force (Air Force) has prepared this Remedial Investigation/Feasibility Study (RI/FS) report to present the results of RI/FS activities at four sites located at the Point Lay radar installation. The remedial investigation (RI) field activities were conducted at the Point Lay radar installation during the summer of 1993. The four sites at Point Lay were investigated because they were suspected of being contaminated with hazardous substances. The RI/FS was conducted in accordance with the requirements of the Air Force Installation Restoration Program (IRP). RI activities were conducted using methods and procedures specified in the RI/FS Work Plan, Sampling and Analysis Plan (SAP), and Health and Safety Plan (U.S. Air Force 1993a,b,c).

Section 1.0 of this report presents information concerning the objectives and implementation of the IRP, a description of the installation and the environmental setting at Point Lay, and brief background information on the four Point Lay sites. Project activities, including project objectives and scope, summaries of field and laboratory methods, methodologies for data evaluation and risk estimation, and a summary of background sampling, analytical results, and migration pathways are described in Section 2.0. Section 3.0 documents the RI sampling and analysis results on a site-by-site basis for the four sites where remedial actions may be warranted; identifies all Applicable or Relevant and Appropriate Requirements (ARARs), potential migration pathways, and receptors; summarizes the human health and ecological risks; and describes the conclusions and recommendations, including the recommended remedial alternative, for cleanup at each of the sites. Section 4.0 presents the feasibility study (FS) of potential remedial actions for the sites that may require cleanup.

The recommended actions for each of the sites, presented in Sections 3.0 and 4.0, are preliminary. The actions for each site will be determined only after review of this RI/FS document and the Point Lay Risk Assessment (U.S. Air Force 1996) by regulatory agencies and interested parties. During the decision process the public will be notified through fact sheets and public notices as to the recommended action for each site, and will be given the opportunity to comment on the proposed action for each site.

Appendix A provides references and a list of acronyms used in this document. Appendix B presents photographs of the Point Lay radar installation and sites. Appendix C is the Statement of Work describing the scope of the RI/FS activities at the Point Lay radar installation. Sample collection logs are presented in Appendix D; sample Chain-of-Custody forms are in Appendix E. Cross-reference tables and analytical data are presented in Appendix F, and data validation reports are in Appendix G.

1.1 THE UNITED STATES AIR FORCE INSTALLATION RESTORATION PROGRAM

The Air Force IRP is the basis for assessment and response action on Air Force installations under the provisions of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). The Air Force IRP is designed to identify, confirm/quantify, and remedy problems associated with past and present management of hazardous substances and

hazardous wastes at Air Force facilities. CERCLA defines a hazardous substance in Section 101; the definition includes, as examples, any substance designated pursuant to Section 311(b)(2)(A) of the Federal Water Pollution Control Act (FWPCA), any element, compound, mixture, solution, or substance designated pursuant to Section 102 of CERCLA, and hazardous wastes identified pursuant to Section 3001 of the Resource Conservation and Recovery Act (RCRA). A hazardous waste, as defined in RCRA, "may pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of or otherwise managed" (Section 1004[2][B] of RCRA).

The Department of Defense (DOD) initiated the IRP in 1976 to identify, investigate, and mitigate environmental hazardous waste contamination that may be present at DOD facilities. In June 1980, DOD issued Defense Environmental Quality Program Policy Memorandum (DEQPPM) 80-6, requiring identification of past hazardous waste disposal sites at DOD agency installations. The Air Force implemented DEQPPM 80-6 in December 1980 and revised it in 1981.

Executive Order 12316 of 14 August 1981 directed the military to design its own program to remedy uncontrolled hazardous waste disposal sites consistent with the National Contingency Plan (NCP) established by CERCLA. In response to the directive, the DOD instructed its branches to identify hazardous waste disposal sites to which they contributed wastes, and to comply with environmental regulations at the installation level when implementing cleanup. DOD subsequently developed the basic IRP after which the Air Force IRP was modeled. DEQPPM 81-5 of 11 December 1981, implemented by Air Force Headquarters in January 1982, sets forth the basic authority and objectives for the Air Force programs.

The Superfund Amendments and Reauthorization Act of 1986 (SARA) augmented the scope and requirements of CERCLA and provided specific directives to federal facilities regarding investigation of waste disposal sites. Under SARA, technologies that provide permanent removal or destruction of hazardous wastes or contaminants are preferable to actions that only contain or isolate the materials. SARA also provides for greater interaction with public and state agencies and expands the role of the U.S. Environmental Protection Agency (EPA) in the evaluation of the health risks associated with contamination. SARA requires early determination of ARARs and the consideration of potential remediation alternatives at the initiation of an RI/FS. Remedial actions taken under CERCLA must comply with ARARs, which generally consist of federal, state, and local regulations. Remedial actions at facilities regulated under CERCLA are selected based on the results of an RI/FS. The RI/FS process is described in the NCP. The RI phase includes specific steps for determining the nature and extent of environmental contamination. Subsequently, the FS is implemented to evaluate alternative remedial actions prior to selection of the most appropriate action for a specific facility.

To respond to changes in the NCP brought about by SARA, the Air Force modified its IRP in November 1986 to improve continuity in the site investigation and remedial planning process for Air Force installations. In July 1987 the President signed Executive Order 12580, delegating responsibility to secretaries of various agencies to conduct site investigations and remedial actions at federal facilities. The order defined relationships between various federal and state agencies and assigned EPA the role of facilitator in resolving conflicts.

Prior to 1988 the Air Force IRP was organized into four phases, described below:

- Phase I, Installation Assessment/Records Search, identified past waste disposal sites at Air Force installations that might pose a hazard to public health or the environment. Sites identified during Phase I could be recommended for no further action, confirmation studies (Phase II), or remedial action (Phase IV).
- Phase II, Confirmation/Quantification, was intended to define and quantify contamination present at sites identified during Phase I. Stage 1 of Phase II consisted of an initial assessment, including environmental sampling, to determine whether contamination was present. Depending on the results of Stage 1, subsequent stages of investigation could be recommended to improve the characterization of site contamination.
- Phase III, Technology-Based Development, included development of new technologies for treating contaminants identified at Air Force installations. The results of Phase II investigations were used to determine the need for Phase III activities.
- Phase IV, Remedial Action, involved development and implementation of plans to remedy contamination at sites.

In 1988, the Air Force replaced the phased approach of the IRP with an approach more closely resembling the RI/FS approach used by EPA. Under this approach, Phase II investigations and Phase IV remedial action planning are conducted in a more parallel fashion to expedite implementation of site cleanups.

1.2 INSTALLATION DESCRIPTION AND ENVIRONMENTAL SETTING

Point Lay radar installation, also known as LIZ-2, has been active since 1955. The Point Lay DEW Line station is one of many DEW Line stations located across the arctic regions of North America and Greenland. The stations were designed to operate and maintain radar systems for the detection of aircraft that may be a threat to national security.

The Point Lay installation was constructed as an auxiliary station. The installation consists of one 24-module train, rotating radar, and support facilities. The rotating radar is located in the radome, which is adjacent to the module train. There are also four communications dishes located southeast of the module train. Support facilities include a garage, warehouse, hangar, and a 3,519-foot long lighted gravel runway.

A variety of past activities at the installation may have resulted in environmental contamination. The Air Force is investigating and remediating actual and potential sources of contamination through activities conducted under the IRP.

1.2.1 Physical Geography

The Point Lay radar installation is located at 69°43'N, 163°00'W in the western portion of the Arctic Coastal Plain, near the shorelines of Kasegaluk Lagoon and the Chukchi Sea, immediately south of the village of Point Lay. The 1,442-acre installation of Point Lay was constructed as an auxiliary station in 1955 as part of the DEW Line radar and communications system established along North America's border. The general location of Point Lay radar installation is shown on Figure 1-1. An area location map is presented in Figure 1-2, and a site plan is provided on Figure 1-3.

1.2.2 Climate (Meteorological Conditions and Air Quality)

The National Weather Service operates a meteorological monitoring station at Barrow, about 185 miles to the northeast. This is the closest monitoring station to the Point Lay facility, although temperature and precipitation have been measured at the Point Lay installation.

Temperatures at the Point Lay installation are generally low throughout the year, with average summer temperatures ranging from 32°F to 53°F and average winter temperatures from -27°F to -5°F. The highest temperature recorded was 78°F in July 1955, and the lowest was -55°F in March 1956 (Hart Crowser 1987).

Precipitation is very low at the Point Lay installation. The annual average precipitation is 7 inches, including 21 inches of snow. Most precipitation occurs in July and August; precipitation from October through May is mostly snow. Storms are usually from the west during the summer, when high pressure systems centered over the northern Pacific force storm tracks northward through the Bering Strait, then easterly toward the installation.

Prevailing winds are northeasterly year-round with a mean speed of 12 mph. November winds are slightly stronger than those of other months, but there is little variation in wind speed from one month to the next. Winds of 35 mph or more are not uncommon, and gusts can occasionally attain much greater speeds.

No air quality measurements have been conducted in the area, but air quality is expected to be good because there are no significant emission sources.

1.2.3 Geology

This section presents information on the regional and local geology of the Point Lay area.

1.2.3.1 Regional Geology. Geologic units of all the principal time-stratigraphic systems from Precambrian to Quaternary are represented in Alaska. For the last two or three million years, frost climates have prevailed in Alaska, and the geomorphic processes have been either periglacial or glacial (Wahrhaftig 1965). Although glacial activity was extensive, it was by no means all-encompassing. Glaciation is evident in many parts of the state including the Pacific Mountain System, Arctic Mountains, Ahklun Mountains, and southern Seaward Peninsula. Some great expanses, however, had no glacial activity. The principal areas not glaciated include the





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BEAUTORY SEA

GULFOF ALASKA

LEGEND

▲ RADAR SITE

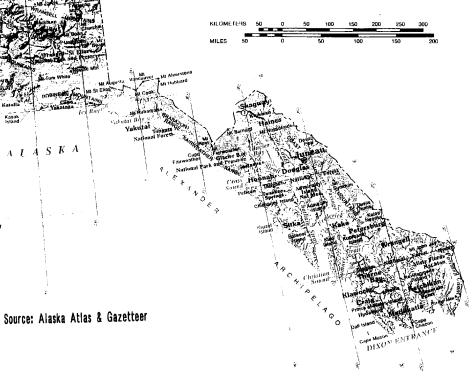
ALASKA REMOTE RADAR INSTALLATION

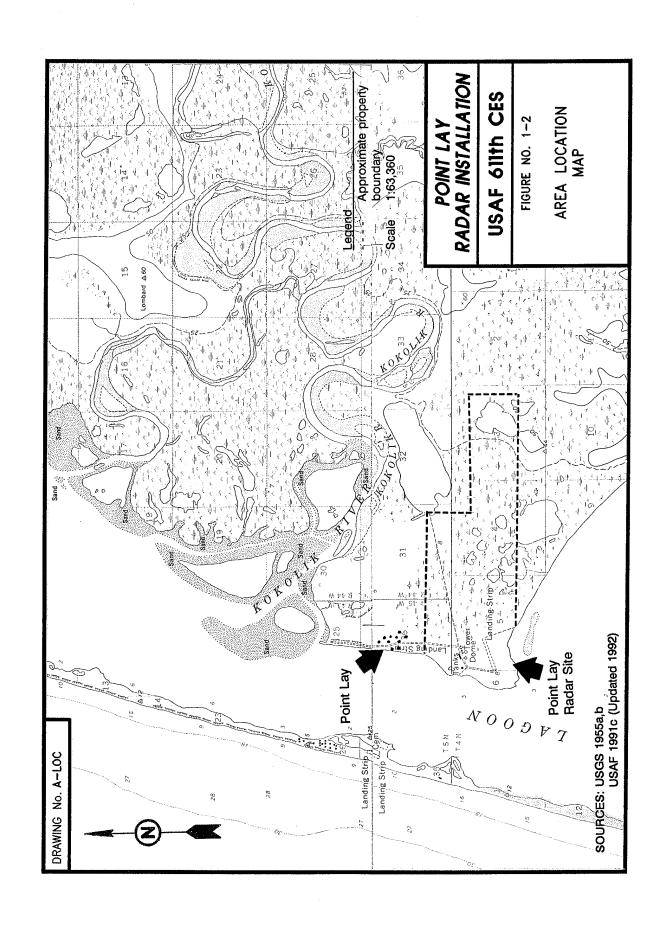
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FIGURE NO. 1-1

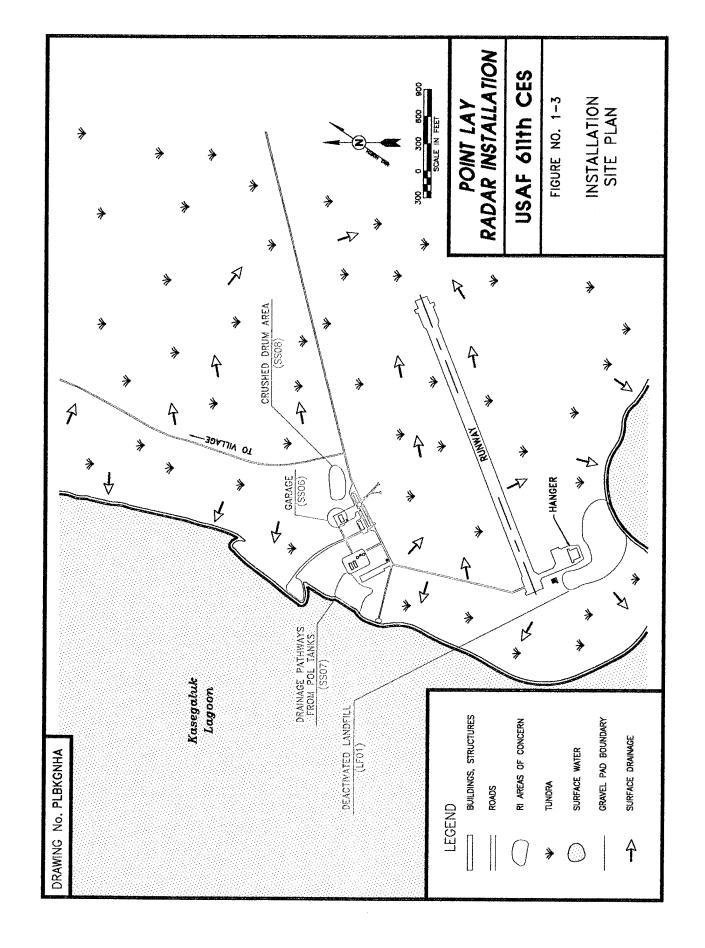
GENERAL LOCATION MAP







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Intermountain Plateaus, Arctic Foothills, and Arctic Coastal Plain. Many periglacial features such as polygonal ground, sorted circles, pingos, and ice wedges can be observed on the Arctic Coastal Plain. Figure 1-4 depicts the extent of Alaska's glacial areas.

Alaska's generally cold climate regime has produced permafrost, a combination of geologic, hydrologic, and meteorologic characteristics that produces permanently frozen ground. Permafrost occurs in both unconsolidated sediments and bedrock; its distribution includes most of the state with the notable exception of the Pacific Coastal area. Permafrost is continuous on the Arctic Coastal Plain and has a significant impact on the flow of ground and surface water. The distribution of Alaska's permafrost areas is shown on Figure 1-5. Permafrost is discussed in detail in Section 1.2.4.1.

The very strong geologic processes at work in Alaska have produced a unique environmental setting reflected in the general geology of the Arctic Region (Figure 1-6). A popular theory of the formation of the Arctic Region is that it was once an ocean basin adjacent to the Canadian Shield. Rifting of the Canadian Shield occurred during Mesozoic time, and the Arctic Region drifted southwest forming the Colville Basin to the south and the Arctic Ocean to the north. At the same time, the Brooks Range orogeny began creating a source for the newly-created Colville Basin. Continued uplift of the Brooks Range produced a prograding delta that filled in the Colville Basin.

1.2.3.2 Local Geology. The Point Lay facility is located on a low coastal bluff east of Kasegaluk Lagoon approximately eight feet above mean sea level (AMSL). The lagoon is formed by a thin barrier island system, located approximately one mile offshore, that roughly parallels the coast for approximately 120 miles.

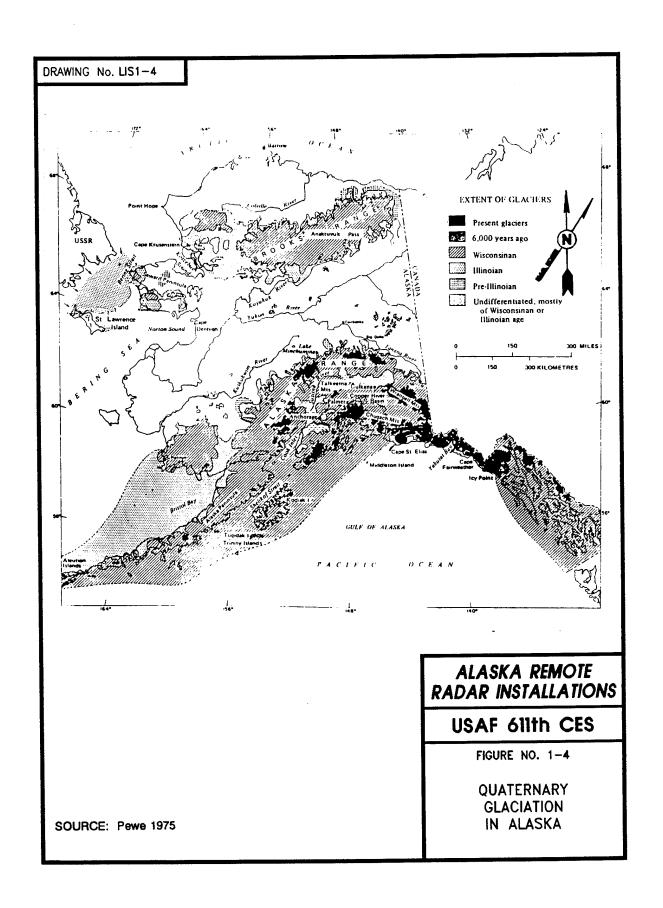
The upper 12 to 18 inches of material in the vicinity of the installation consists of Holocene-age silty loam and an organic layer, called a tundra mat, that provides an insulating barrier between the air and the underlying perennially frozen ground. The area is underlain with shallow mediumto fine-grained sands and silts. As shown by the presence of numerous small lakes, and ponds, the silty loam is generally poorly drained. At the installation, the tundra mat and silts have been removed and gravel has been placed over the older sediments to provide a foundation for the existing DEW Line facilities.

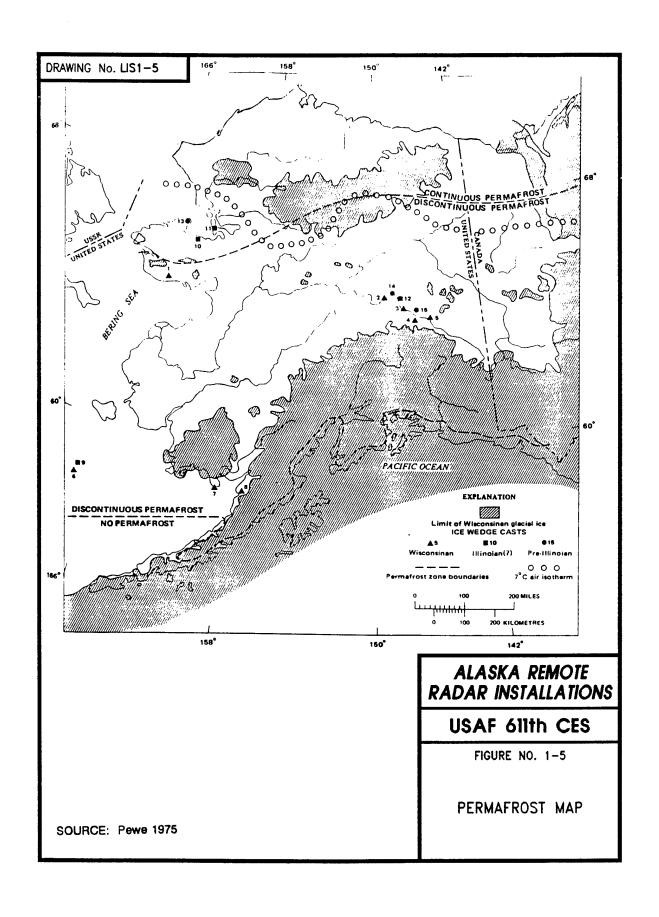
There are no mineral deposits of economic value in the vicinity of the installation. The area is currently being explored for potential oil and gas deposits. The entire area is underlain by coal-bearing rocks, and small-scale mining occurs periodically in several areas south of the Point Lay installation where the coal crops out along the Kukpowruk River.

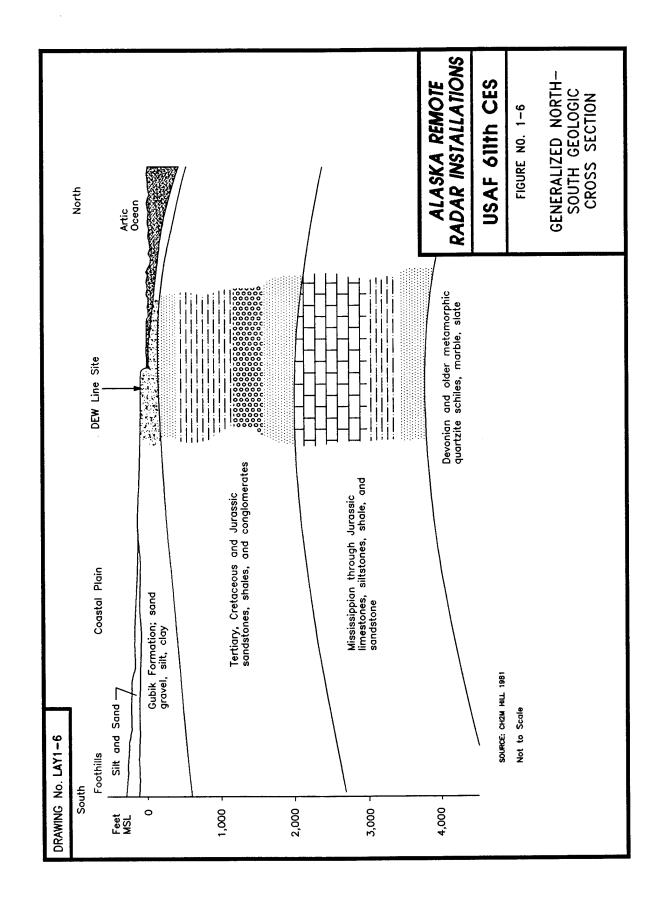
1.2.4 Hydrology

Ground water/permafrost and surface water are discussed in the following sections.

1.2.4.1 Ground Water/Permafrost. Permafrost has a profound influence on Alaska's ground water resources. Permafrost is defined by the *Glossary of Geology* (American Geological Institute 1972) as:







Any soil, subsoil, or other surficial deposit, or even bedrock, occurring in arctic or subarctic regions at a variable depth beneath the earth's surface in which a temperature below freezing has existed continuously for a long time (from two years to thousands of years). This definition is based exclusively on temperature and disregards the texture, degree of compaction, water content, and lithologic character of the material.

Permafrost has a major impact on the relationship between surface water and ground water in cold regions such as Alaska. Although ground water in permafrost regions follows the same geologic and hydrologic principles as in temperate areas, the hydrologic regime is modified in the following ways:

- Permafrost acts as an impermeable barrier to the movement of ground water because pore spaces are ice-filled in the zone of saturation. Recharge and discharge are, therefore, limited to unfrozen channels penetrating the permafrost zone. The unfrozen channels are termed perforating taliks. Permafrost restricts the downward percolation of water and increases runoff, enhancing the creation of lakes and swamps (Feulner et al. 1971).
- Permafrost zones tend to reduce evapotranspiration. The generally low ground temperatures tend to reduce direct evaporation and transpiration (the escape of moisture through plant tissue into the air). Vegetation growth is enhanced near large surface water bodies where permafrost usually occurs at greater depth.
- Permafrost restricts an aquifer's storage capacity and the number of locations from which ground water may be withdrawn. Subpermafrost ground water occurs beneath the permafrost zone and is usually dependable. Suprapermafrost water occurs in the active zone, above the permafrost table, and tends to be seasonal; it freezes during the cold winter months.
- The ground water temperature varies from 32 to 40.1°F in permafrost regions because of the low ground temperatures (Williams 1970). Water tends to be more viscous in this temperature range and, therefore, moves slower than in temperate regions.

Low ground temperatures create the necessary environment for permafrost to form. The segment above the permafrost table is called the active zone, because it freezes and thaws with seasonal weather changes. The permafrost zone remains frozen year-round. The active zone is significant because suprapermafrost active zone water exists within it.

Ground water has been found in aquifers beneath the continuous permafrost, but little is known of these aquifer systems. Shallow ground water sources are also present in river gravel and in thaw bulbs beneath deep lakes. Active zone water is found during the summer months when this layer thaws, but the layer is relatively thin. The thickness of the active zone at Point Lay is estimated to range from one to six feet.

Surface features may have dramatic impacts on the subsurface distribution of permafrost because they influence heat transfer. Heat flow through surface water is greater than through land. Permafrost may be discontinuous or present at greater depth under and near large bodies of water such as rivers or deep lakes. Smaller bodies of water may affect the configuration of the permafrost surface or the total thickness of the permafrost at any given point. Figure 1-7 is a generalized representation of the relationship of surface features to the underlying permafrost.

1.2.4.2 Surface Water. At the Point Lay installation, surface drainage occurs as suprapermafrost sheet flow into Kasegaluk Lagoon or into the wet lowlands that surround the installation. There are no major streams that drain the installation. Surface water drainage features in the vicinity of the installation are presented in Figure 1-8. The area surrounding Point Lay contains three major rivers. The Kokolik River is approximately two miles directly north of the installation. The Epizetka and Kukpowruk rivers are six and eight miles south, respectively (Woodward-Clyde 1989).

Water in the lagoon and thaw lakes remains frozen from November to June. When the breakup of ice in the river occurs in July, there is a high potential for flooding due to the lack of relief and the blocking of streams by broken ice. The village of Point Lay has been moved several times because of flooding.

Most fresh water is obtained from deep lakes near the village. The Point Lay installation receives drinking water from a freshwater lake 1.5 miles to the east of the village. During winter, water is pumped from beneath ice that is six to eight feet thick.

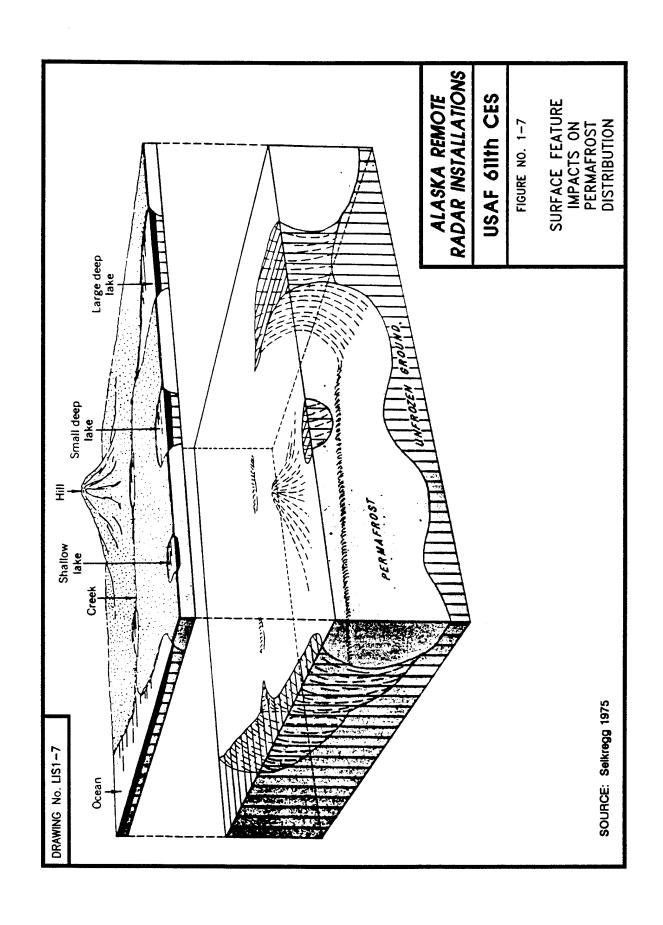
1.2.5 Industrial Activities

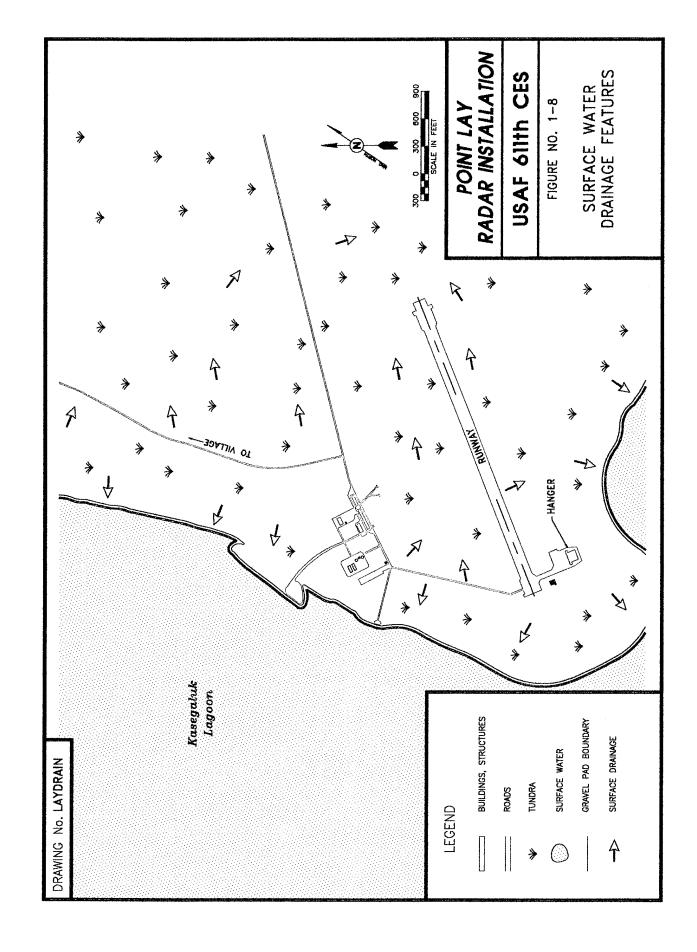
Primary industrial activities at the installation include operation and maintenance of the radar system. The Point Lay radar installation was built to support the air defense system in Alaska. The installation became operational in 1953 when communications were provided by high frequency radio. The original equipment still remains but was replaced with new Long Range Radar and satellite earth terminal systems, which are presently operational. Other industrial activities include maintenance associated with facility operation such as minor construction, road upkeep, and vehicle maintenance. Currently there are approximately four people stationed at the Point Lay installation.

Presently the installation consists of one 24-module train, rotating radar, and support facilities. The rotating radar is located in the radome, adjacent to the module train. The main section of the train houses the electric equipment work areas, a limited number or personnel quarters, administration offices, a mechanical room with emergency boiler and fuel storage, dining, kitchen, and recreation areas, water storage, showers, and toilets. There are also four communications dishes located southeast of the module train. Support facilities include a garage, warehouse, POL Tanks, and 3,519-foot long lighted gravel runway.

1.2.6 Biology

This section presents information on the regional fauna and flora of the Point Lay area.





1.2.6.1 Vegetation. The vegetation at the Point Lay installation is characteristic of wet sedge meadows and tussock tundra. Mixtures of wetlands as described by Bergman et al. (1977) are also evident. The barrier islands support a marine zone vegetation type characterized by coarse grasses and succulent herbs (Koranda and Evans 1975).

The local habitats support a variety of grasses, *Dupontia* spp., *Arctophila* spp., *Poa* spp.; sedges, *Carex* spp.; rushes, *Juncus* spp.; cottongrass, *Eriophorum* spp.; saxifrage, *Saxifraga* spp.; and various mosses. Dwarf willows, *Salix* spp., are common in the vicinity, but their extent is limited. All vegetation is less than three feet high.

- **1.2.6.2** Fishes. The species associated with the aquatic habitats of the Kasegaluk Lagoon, and the Kukpowruk and Kokolik Rivers include salmon, *Oncorhynchus* spp.; smelt, *Osmerus* spp.; herring, *Clupea* spp.; arctic char, *Salvelinus* alpinus; grayling, *Thymallus* arcticus; whitefish and cisco, *Coregonus* spp.; and arctic flounder, *Liopsetta glacialis* (NPRA Task Force 1978). These habitats support significant spawning, rearing, and feeding activities.
- **1.2.6.3 Birds**. The Kasegaluk Lagoon system is an excellent habitat for migratory and nesting waterfowl and shorebirds (Koranda and Evans 1975). Loons, *Gavia* spp.; arctic tern, *Sterna paradisaea*; jaegers, *Stercorarius* spp.; sandpipers, *Calidris* spp.; phalaropes, *Phalaropus* spp.; eiders, *Somateria* spp.; and brant, *Branta bernicla*, are species common to the area (Koranda and Evans 1975; NPRA Task Force 1978). Ptarmigan, *Lagopus* spp., are an important subsistence species, but the extent of local occurrence is unknown.
- **1.2.6.4 Mammals**. Marine mammals that may frequent the area of Kasegaluk Lagoon include walrus, *Odobenus rosmarus*; bearded seals, *Erignathus barbatus*; spotted seals, *Phoca hispida*; polar bear, *Ursus maritimus*; and beluga, *Delphinapteras leucas* (Koranda and Evans 1975; NPRA Task Force 1978). Bowhead, *Balaena mysticetus*, and gray whales, *Eschrichtius robustus*, pass offshore during their migrations.

Terrestrial mammals representative of the wet tundra environments include shrews, *Sorex* spp.; brown lemming, *Lemmus trimucronatus*; microtine rodents, *Microtus* spp.; arctic fox, *Alopex lagopus*; and weasels, *Mustela* spp. Caribou, *Rangifer tarandus*, from the Western Arctic Herd pass through the area and are an important subsistence resource. Other terrestrial mammals important to subsistence include marmot, *Marmota caligata*; arctic ground squirrel; *Spermophilus parryii*; brown/grizzly bear, *Ursus arctos*; red fox, *Vulpes vulpes*; gray wolf, *Canis lupus*; and wolverine, *Gulo luscus* (NPRA Task Force 1978).

1.2.6.5 Threatened and Endangered Species. Threatened and endangered species potentially occurring in the vicinity of the Point Lay installation include spectacled eider, *Somateria fischeri* (threatened); Steller's eider, *Polysticta stelleri* (candidate for listing); and bowhead whale (endangered). According to surveys done by Alaska Biological Research (1994), neither the spectacled nor Steller's eider were found within the Point Lay installation boundaries, although there is potentially suitable habitat and a potential for nesting or brood-rearing in the vicinity of the installation. The bowhead whale may pass offshore of the installation during migration. The arctic peregrine falcon, *Falco peregrinus tundrius*, and gray whale, two previously listed species

with potential to occur near the installation, were delisted by the U.S. Fish and Wildlife Service, 5 October 1994, and by the National Marine Fisheries Service, 16 June 1994, respectively.

1.2.7 Demographics

An average of four personnel are stationed at the Point Lay facility. The village of Point Lay had an estimated population of 139 in 1990 (U.S. Bureau of the Census 1991). The community of Point Lay is one of the more recently established Inupiat villages on the arctic coast.

Air travel provides the only year-round access to the Point Lay area. Marine transport is available during the ice-free period of about mid-July to September or October. There are no roads linking the community of Point Lay or the DEW Line station to other communities on the North Slope. Overland travel is difficult in the summer, but during the winter snowmobiles and all-terrain vehicles (ATVs) are used to travel over the frozen tundra.

1.2.7.1 Local Economy. Subsistence is a way of life for many of the people in Point Lay; however, the area within the installation boundary is not used for subsistence purposes because of restricted status. For the most part, the population of Point Lay consists of young Eskimos. The few non-Eskimo residents have either assimilated into the community's lifestyle or were attracted to the community by borough service employment such as jobs with the school district. The population of Point Lay has increased 54 percent since the relocation of the village to its present site; almost 90 percent of the village residents in 1982 were Alaska Natives (Alaska Consultants, Inc. 1983).

Economic opportunities are limited because of the relative isolation at Point Lay. Contract construction work related directly to North Slope borough capital improvement projects accounted for 57 percent of all jobs in Point Lay. Government provided 34.5 percent of the employment in Point Lay, almost all of which was in borough-related school and utility operations. The only private sector jobs in Point Lay were three jobs in the Point Lay community store and three jobs associated with the borough construction camp (Hart Crowser 1987). No Point Lay residents are presently employed at the installation, but some residents have been employed there in the past.

1.2.7.2 Cultural Resources. Cultural resources identified in the area are listed in Table 1-1. All of the known cultural resource sites are of traditional importance. These sites have not been evaluated for listing in the National Register of Historic Places. No prehistoric sites in the vicinity of Point Lay are listed in the site files of the Alaska Heritage Resources Survey. However, systematic cultural resource surveys have not been conducted in this area.

One historic site, the remains of an undated house (TLUI Site 26) and possible burial site, was disturbed during construction of the Point Lay DEW Line station in the 1950s. The current condition of the site is unknown.

TABLE 1-1. KNOWN CULTURAL RESOURCE SITES IN THE VICINITY OF POINT LAY RADAR INSTALLATION^a

SITE NAME	TLUI # ^b AHRS #	DESCRIPTION	LOCATION
Kayuqtualuk	<u>22</u> 	Mythological significance; no visible remains.	Point Lay area.
Kali	<u>24</u> 	Mound associated with local mythology; 1920s graveyard present.	Immediate vicinity of Point Lay, to the southwest.
None	<u>26</u> 	Remnants of undated house structure and possible burials, reportedly disturbed during Point Lay construction.	Kokolik River, approximately 1.5 miles northeast of Point Lay.
Point Lay	 XPL-053	Village site abandoned in 1953 with school closure; extant buildings, occupied during summer months.	On Barrier Island, approximately 2 miles northwest of Point Lay.
Niaquq or Singigruaq	<u>11</u> 	Ancestral home of some Point Lay residents.	15 miles south of Point Lay.

Data from Schneider and Bennett (1979); Alaska Division of Geological and Geophysical Survey Records (1984).

TLUI = Traditional Land Use Inventory.

AHRS = Alaska Heritage Resources Survey.

Source: Hart Crowser 1987

1.2.7.3 Recreation. Little recreational use is made of this area because of limited access and the lack of accommodations and facilities. Limited hunting and fishing takes place; these activities are mostly subsistence-oriented and are not considered recreation. Local residents engage in snowmobiling and dog sled races, but most recreation is conducted indoors, with the school in Point Lay serving as the hub for recreational activities, and providing space for such activities as bingo or movies (Alaska Consultants, Inc. 1983).

1.3 SITE INVENTORY

This section presents information on the IRP sites at the Point Lay radar installation. It includes summaries of previous IRP activities and remedial actions that have been conducted at the installation.

1.3.1 Sites at Point Lay

Four sites at the Point Lay radar installation were investigated during the 1993 RI activities. One site, the Deactivated Landfill (LF01) was determined to be of concern based on previous IRP sampling data. Additionally, there were three sites identified for investigation based on previous IRP activities and the 1993 RI activities: literature search, pre-survey and reconnaissance trips, communication with personnel from Alaska Department of Environmental conservation (ADEC), and information on disposal practices at DEW Line stations. The additional sites include the Garage (SS06), Drainage Pathway from POL Tanks (SS07), and Crushed Drum Area (SS08). Prior to this RI/FS, no sampling had been conducted at these three sites.

It should be noted that none of the four sites is on, or is proposed to be included on, the national priority list (NPL) of Superfund sites.

1.3.2 Previous IRP Activities

An Air Force contractor conducted Phase I Installation Assessment/Records Search activities at the Point Lay radar installation and six other DEW Line stations in 1980 and 1981 (CH2M Hill 1981). Phase I activities included a detailed review of pertinent installation records from both government and civilian contractors, contacts with various government and private agencies for documents relevant to the program, and onsite visits during July and August 1981. The onsite visits included interviews with key station employees, ground tours of station facilities, and plane overflights to identify past disposal and possible contaminated areas.

Stages 1 and 2 of the Phase II Confirmation/Quantification activities were conducted in 1986 (Dames and Moore 1986, 1987). Phase II, Stage 1 activities involved field investigations of specific sites that were identified in the Phase I Installation Assessment/Records Search activities. Surface water samples were collected at three sites at the Point Lay installation.

A Technical Operations Plan for the Phase II, Stage 2 work was prepared in August 1986 (Dames and Moore 1986). Phase II, Stage 2 activities involved field investigation of three sites. Five water samples were collected. Onsite observations and analytical results were recorded in the Phase II, Stage 2 Draft Report (Dames and Moore 1987).

A private contractor prepared the Environmental Assessment for the North Warning System (Alaska), in January 1987 (Hart Crowser 1987). The report discussed the impacts of retrofitting with Long Lange Radar equipment at the Point Lay DEW Line facility.

An Air Force contractor released the final Technical Support Document for Record of Decision, LIZ-2 DEW Line site, in 1987 (Woodward-Clyde 1989). The Record of Decision, applicable to five potential hazardous waste sites identified at the Point Lay installation, called for no further action with regard to investigation or cleanup, based on the assessment that there is no significant impact on human health or the environment from suspected or confirmed contamination at the installation. However, correspondence from ADEC personnel to Air Force personnel in November 1991 disagreed with the "no further action" conclusion, and stated that further investigation was

needed and corrective action appeared necessary because of improper waste disposal practices and other issues.

1.3.3 Previous Remedial Actions

Previous IRP investigations conducted at the Point Lay installation have not determined the need for remedial actions at any of the sites investigated. Therefore, no previous remedial actions have been conducted at the installation.

2.0 PROJECT ACTIVITIES

This section of the report describes the project objectives and scope, the RI field program and methodology, the analytical programs, background sampling, and analytical results. In addition, data evaluation, risk estimate methodologies, potential migration pathways, and receptors are presented.

2.1 PROJECT OBJECTIVES AND SCOPE

The objectives of the Point Lay DEW Line radar installation RI/FS are to confirm the presence or absence of chemical contamination in the environment at the installation; define the extent and magnitude of confirmed chemical releases; gather adequate data to determine the magnitude of potential risks to human health and the environment; and gather adequate data to identify and select the appropriate remedial actions for sites where apparent risks exceed acceptable limits or contamination exceeds regulatory guidelines. The project objectives include the following goals:

- Define the horizontal and vertical extent of soil contamination and the range of contaminant concentration;
- Determine the physical and chemical properties of soil contaminants to describe contaminant toxicity and mobility;
- Define the extent of surface and active zone water contamination and the range of contaminant concentrations;
- Describe real and potential surface and subsurface contaminant migration pathways in terms of movement of dissolved and suspended contaminants through the active zone above permafrost, and movement of dissolved and suspended contaminants in surface water;
- Generate adequate valid data to support development of a baseline risk assessment that quantifies, to the extent possible, potential risks to human health and the environment posed by chemicals of concern (COCs) at the Point Lay DEW Line installation studied under this RI; and
- Select the most feasible remedy, cleanup action, to reduce risks at sites where risks exceed acceptable limits.

2.2 RI FIELD ACTIVITIES

This section presents a summary of the field activities conducted during the RI, the organization of the RI field team, and the chronology of field work.

2.2.1 RI Field Program

The RI field program at the Point Lay radar installation was carried out in accordance with the RI/FS Work Plan, the SAP, and the Health and Safety Plan (U.S. Air Force 1993a,b,c). These RI/FS planning documents were developed as specified in the Delivery Order No. 22 Statement of Work (Appendix C) and IRP Handbook (U.S. Air Force 1991a).

The scope of the field investigation was described in detail in the Field Sampling Plan (U.S. Air Force 1993b). The field activities included the following:

- Collecting and analyzing surface and subsurface soil samples and sediment samples from sites with potential or confirmed contamination. These samples were described and analyzed for petroleum and other chemical residues. Samples were collected using hand tools.
- Collecting and analyzing samples of surface water from potentially affected streams, surface water features such as lakes or ponds, and any apparent leachate discharge points.
- Collecting and analyzing background soil, sediment, and surface water samples to characterize natural background conditions.
- Measuring relative surface elevations of sampling points and stream channels to determine surface slopes and stream gradients.
- Collecting samples of potential chemical residues and waste materials at sites where such materials were suspected and had not yet been characterized.
- Conducting real-time air monitoring using portable field instruments.
- Measuring surface distances and approximate elevations to locate sampling points relative to fixed reference points.

The RI activities described above were carried out in three phases as follows:

• <u>Installation Pre-Survey.</u> The pre-survey was conducted by a small group of contractor employees (four total) accompanied by Air Force representatives. The purpose of the pre-survey was to confirm the location of areas of environmental concern at the installation. Pre-survey activities were limited to visual inspection of the sites, surface distance measurements, site photography, and confirmation of the location of structures and sites as shown on installation plan maps. The information gathered from the pre-survey was combined with existing documentation to support development of the RI/FS scoping documents. The pre-survey was completed at the Point Lay installation on 14 May 1993 by an Air Force contractor.

- Installation Reconnaissance. The installation reconnaissance was conducted by a group of contractor employees on 23 June 1993. The purpose of the reconnaissance was to identify sampling locations for investigation during the RI. The contractor staff made detailed observations of potentially contaminated areas and performed limited intrusive activities (e.g., digging shallow holes with a shovel to determine the apparent depth of contamination at areas of soil staining). Data gathered during the installation reconnaissance provided the basis for determining the sites to be sampled, the approximate number of samples and their locations, analyses for each sample, and equipment and supply needs for the RI.
- Remedial Investigation Field Activities. The RI field activities were conducted from mid-August through early September of 1993. The RI was conducted in conjunction with RIs at seven other radar installations located throughout northern Alaska. Fifteen contractor employees were stationed in Alaska for the duration of the RI. Intrusive sampling activities at the Point Lay radar installation included collection of surface and subsurface soil samples with hand tools (e.g., shovels, scoops, bucket augers) and collection of surface water, sediment, and seep samples from drainages adjacent to landfills and potentially contaminated areas. The RI activities also included operation of temporary northern Alaska (Barrow, Alaska) laboratory facilities operated by a subcontractor.

2.2.2 Field Team Organization and Subcontractors

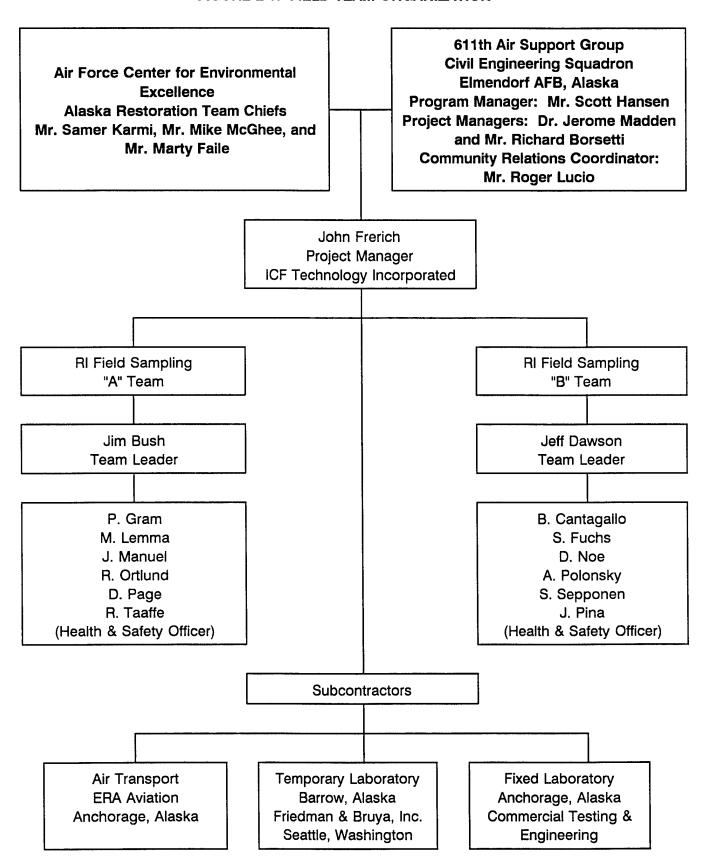
The organization of the RI field team, the responsibilities of the RI team members, and subcontractors used during RI activities are presented in Figure 2-1 (Note: all Point Lay sampling was conducted by the "B" RI Field Sampling Team). The Air Force Center for Environmental Excellence (AFCEE) restoration team chiefs that managed and conducted oversight of the RI field activities included Mr. Marty Faile, Mr. Mike McGhee, and Mr. Samer Karmi.

2.2.3 Chronology of Field Work

The RI field work at the Point Lay radar installation conducted during summer 1993 was accomplished in the following chronological order:

14 May	Conducted pre-survey
23 June	Conducted reconnaissance
22 August	Stockpiled RI sampling supplies at Point Lay radar installation. Staked out 52 sample locations at LF01, SS06, SS07, SS08, and background.
23 August	Staked out four sample locations at LF01. Collected nine soil samples at SS08, five soil and two water samples for background, and three quality assurance/quality control (QA/QC) samples.

FIGURE 2-1. FIELD TEAM ORGANIZATION



24 August Staked out five sample locations at LF01 and SS06. Collected 10

soil and 7 water samples at LF01, 3 soil and 3 water samples at SS06, 3 soil and 3 water samples at SS07, 2 water samples at

SS08, and 8 QA/QC samples.

07 September Staked out 24 sample locations at LF01, SS06, SS07, and SS08.

Collected three soil and two water samples at LF01, six soil samples at SS06, three soil and three water samples at SS07, five

soil samples at SS08, and four QA/QC samples.

08 September Demobilized equipment.

2.3 RI SAMPLING AND ANALYSES

A summary of the RI sampling and analysis activities conducted during this investigation is presented in this section. Included are descriptions of the number of samples collected by media, QA/QC samples collected, background sampling and analyses, analytical programs, chronology of laboratory analyses, laboratory QA/QC programs, and data validation and reporting.

2.3.1 Sampling Procedures

Contractor personnel collected samples from various media at the Point Lay radar installation using numerous sample collection methods and procedures. The collection methods were determined at the time of collection, based on sample location and prevailing environmental conditions. Media sampled during the RI included surface and subsurface soils, surface water, and sediment. These media were extracted generally from man-emplaced fill, gravel pads, and scraped areas; and natural tundra soils/sediments and surface water bodies. All sampling tools or other devices used during sampling were decontaminated before use. Standard procedures, developed by the contractor for sampling methodologies used during the RI are presented in Appendix D of the RI/FS SAP (U.S. Air Force 1993b). Sample collection logs for all samples collected during RI activities at the Point Lay installation are presented in Appendix D. The logs provide detailed sample information such as media, location, depth, and analyses requested. Completed chain-of-custody forms for all samples collected during the RI at the Point Lay installation are presented in Appendix E.

2.3.2 Summary of RI Sampling

Contractor personnel collected 97 samples from various media at the Point Lay radar installation. Seven samples were collected to determine organic and inorganic background concentrations in soil/sediment and surface water. Fifteen samples were collected for QA/QC. QA/QC samples included duplicates, replicates, equipment rinsate blanks, trip blanks, and ambient condition blanks. Seventy-five samples were collected to determine the nature and extent of contamination at the four sites at Point Lay. Table 2-1 presents a summary of RI sampling conducted at Point Lay.

TABLE 2-1. SUMMARY OF POINT LAY REMEDIAL INVESTIGATION FIELD SAMPLING ACTIVITIES

ACTIVITY	TOTAL
Water Samples Collected for Lab Analyses (includes QA/QC)	31 samples
Soil/sediment Samples Collected for Lab Analyses (including QA/QC)	66 samples
Drums of Investigation Derived Waste Generated (1 drum water)	0 sample ^a
TOTAL WATER AND SOIL SAMPLES FOR LAB ANALYSES	97 samples

a Investigation derived wastes (IDW) from Point Lay were combined with the IDW from Point Barrow, Point Lonely, and Wainwright. These were collectively sampled during the Point Barrow investigation.

2.3.2.1 Field QA/QC Samples. The field QA/QC program consisted of QA/QC samples, quality control (QC) checks, and limits for field procedures.

QA/QC Samples. QA/QC samples collected during this investigation included duplicate water samples, replicate soil/sediment samples, trip blanks, ambient condition blanks, and equipment rinsate blanks.

During RI sampling activities at the Point Lay installation, QA/QC samples collected included the following: two duplicate water samples, six replicate soil/sediment samples, three trip blanks, one ambient condition blank, and three equipment rinsate blanks. Table 2-2 summarizes all samples collected and analyzed during RI activities at the Point Lay installation, including the QA/QC samples.

In addition to the above QA/QC samples, extra volumes of selected samples were collected and submitted for internal laboratory QA/QC (matrix spike and matrix spike duplicates). Extra sample volumes were submitted at a minimum of 1 per 10 samples. Extra volumes submitted included triple volume for organic water analyses and double volume for inorganic water analyses.

2.3.2.2 Background Sampling and Analyses. Seven background samples were collected from upgradient areas during field activities at the Point Lay radar installation to establish background concentrations for naturally occurring organic compounds. In order to obtain a representative range of inorganic (metal) concentrations in soil/sediments and surface waters of the North Slope, 44 samples (29 soil/sediment and 15 water) from seven North Slope radar installations were collected. The seven installations include Barter Island, Bullen Point, Oliktok Point, Point Lonely, Point Barrow, Point Lay, and Wainwright. Approximately five soil/sediment and two surface water background samples were collected from each of these installations to determine the background concentrations of inorganic analytes across similar coastal arctic environments of the North Slope.



TABLE 2-2. SUMMARY OF SAMPLING AND ANALYSES CONDUCTED

ANALYSES	HVOC*	BTEX	VOC 8260	svoc	Metals	TPH-Diesel ^b Range 3510/3550	TPH - Ga Rang
ANALYTICAL METHOD	SW8010M	SW8020	SW8260	SW8270	SW3050 (Soil) 3005 (Water)/6010	Diesel 8100 M	Gas 5030
POINT LAY (LIZ-2)							,,,
Background (BKGD)	5 Soil 2 Water	5 Soil 2 Water	5 Soil 2 Water	5 Soil 2 Water	5 Soil 2 Water (Total) 2 Water (Dissolved)	5 Soil 2 Water	5 Sc 2 Wa
Deactivated Landfill (LF01)	10 Soil 7 Water	10 Soil 7 Water	4 Soil 3 Water	1 Soil 1 Water	1 Soil 1 Water (Total) 1 Water (Dissolved)	13 Soil 9 Water	13 S 9 Wa
Garage (SS06)	13 Soil 2 Water	19 Soil 3 Water	4 Soil 1 Water	4 Soil 1 Water	2 Soil 1 Water (Total) 1 Water (Dissolved)	21 Soil 3 Water	21 S 3 Wa
Drainage Pathways from POL Tanks (SS07)	3 Water	4 Soil 3 Water	4 Soil 4 Water	1 Water	NA	7 Soil 6 Water	7 Se 6 Wa
Crushed Drum Area (SS08)	9 Soil 2 Water	12 Soil 2 Water	4 Soil 1 Water	3 Soil 1 Water	2 Soil 1 Water (Total) 1 Water (Dissolved)	14 Soil 2 Water	14 S 2 Wa
Total Field Analyses	37 Soil 16 Water	50 Soil 17 Water	21 Soil 11 Water	13 Soil 6 Water	10 Soil 5 Water (Total) 5 Water (Dissolved)	60 Soil 22 Water	60 S 22 W
QA/QC SAMPLES		<u></u>	1			1	
· Trip Blanks	2 Water	2 Water	3 Water	NA	NA	NA	2 Wa
Equipment Blanks	2 Water	2 Water	3 Water	2 Water	2 Water (Total) 1 Water (Dissolved)	2 Water	2 Wa
Ambient Condition Blanks	NA	NA	1 Water	NA	NA	NA	N/
Field Replicates	4 Soil	5 Soil	2 Soil	1 Soil	1 Soil	6 Soil	6 S
Field Duplicates	1 Water	2 Water	1 Water	1 Water	1 Water (Total) 1 Water (Dissolved)	2 Water	2 Wa
Total Site Analyses	41 Soil 21 Water	55 Soil 23 Water	23 Soil 19 Water	14 Soil 9 Water	11 Soil 8 Water (Total) 7 Water (Dissolved)	66 Soil 26 Water	66 S 28 W

NA Not analyzed.

- These analyses were completed on a quick turnaround basis.
- b
- The number of soil sample includes sediment samples collected from surface water features.

 These analyses were completed on a 24-hour turnaround at a temporary fixed laboratory at Barrow, Alaska.

 Investigation derived wastes from Point Lay were combined with the investigation derived wastes from Point Ba



S CONDUCTED FOR POINT LAY REMEDIAL INVESTIGATIONS^a

iesel ^b	TPH - Gasoline ^b	TPH	PCB*	Pesticides*	TDS	TSS	тос	
ge 3550	Range	Residual Range*				133	100	
550								TOTAL
400.14						1		SAMPLES
100 M	Gas 5030/8015M	Diesel 8100M	SW8080/8080M	SW8080/8080M	E160.1	E160.2	SW9060	
							<u> </u>	70160180019
oil	5 Soil	5 Soil	5 Soil	5 Soil	0141	1		
ter	2 Water	2 Water	2 Water	2 Water	2 Water	2 Water	3 Soil	5 Soil
				2 VVaici			2 Water	2 Water
oil	13 Soil	10 Soil	10 Soil	1 Soil	1 Water	1 Water	ļ <u>, , , , , , , , , , , , , , , , , , ,</u>	
ter	9 Water	7 Water	7 Water	1 Water	vvaler	Vvater	1 Soil 1 Water	13 Soil 9 Water
	_	 -					VValei	9 vvater
oil.	21 Self	13 Soil	13 Soil	2 Soil	NA NA	NA	NA NA	21 Soil
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oil	7 Soil	4 Soil	NA	1 Soil	1 Water	1 Water	1 Water	7 Soil
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iter	22 Water	17 Water	11 Water	3 Water		o viaci	5 Water	22 Water
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	NA	NA	NA	NA	NA	NA NA	NA	1 Water
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il	6 Soil	4 Soil	4 Soil	2 Soil	NA	NA	1 Soil	6 Soil
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oil	66 Soil	45 Soil	41 Soil	12 Soil	6 Water	CMA	5.0.11	
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	i			- Traici		J	o vvater	31 Water

arrow, Alaska.

ites from Point Barrow, Point Lonely, and Wainwright. These were collectively sampled during the Point Barrow investigation.

Seven background samples were collected from tundra and pond areas during the RI at Point Lay. These consisted of four soil, one sediment, and two surface water samples.

Four background soil samples were analyzed for diesel range petroleum hydrocarbons (DRPH), gasoline range petroleum hydrocarbons (GRPH), residual range petroleum hydrocarbons (RRPH), benzene, toluene, ethylbenzene, and xylene (BTEX), halogenated volatile organic compounds (HVOCs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), and total metals. In addition, two samples were analyzed for total organic carbon (TOC).

One background sediment sample was analyzed for DRPH, GRPH, BRPH, BTEX, HVOCs, VOCs, SVOCs, pesticides, PCBs, total metals, and TOC.

Two background surface water samples were analyzed for DRPH, GRPH, RRPH, BTEX, HVOCs, VOCs, SVOCs, pesticides, PCBs, TOC, total suspended solids (TSS), total dissolved solids (TDS), and total and dissolved metals.

Data Summary. Background sample locations at Point Lay are illustrated in Figure 2-2. The data summary table (Table 2-3), presents analytical results for all background samples collected at Point Lay. Detection and quantitation limits, action levels, and the associated field and laboratory blank results are included on the data summary table.

Below is a discussion of organic compounds and inorganic analytes detected in background samples at Point Lay. A discussion of TDS, TSS, and TOC is included. Analytical results are presented in Table 2-3 and Figure 2-2.

Organics. No organic compounds were detected in background soil, sediment, or surface water samples. The ranges of background concentrations detected for all analytes are presented in data summary tables for each of the four sites presented in Section 3.0.

Inorganics. Sixteen metals were detected in background soil/sediment samples at Point Lay. The results of inorganic analyses are presented in Table 2-3. TOC was reported in three soil/sediment samples ranging from 57,000 to 69,300 mg/kg.

Eight metals were detected in background surface water samples collected at Point Lay. The results of inorganic analyses are presented in Table 2-3. TOC was reported at 40,000 and 31,700 μ g/L in surface water samples BKGD-SW01 and BKGD-SW02, respectively. In the same two respective samples, TSS were reported at 6,000 and 77,000 μ g/L, and TDS were reported at 149,000 and 151,000 μ g/L.

2.3.3 Laboratory Analyses

This section describes the RI analytical program. Summaries of the soil/sediment and surface water analyses conducted during the RI are presented in Tables 2-4 and 2-5. Table 2-4 presents a description of the soil analytical methods and number of soil samples collected, and Table 2-5

TABLE 2-3. BACKGROUND ANALYTICAL DATA SUMMARY

Installation: Point Lay Site: Background (BKGD)	oint Lay and (BKGD)		Matrix: Soil/Sediment Units: mg/kg	I/Sediment kg										
						<u> </u>	Environmental Samples	s			Field Blanks		dad	- م
Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Range	301	802	803	S04	SD01	AB01	EB01	1801	Bianks	2
Laboratory Sample ID Numbers					433 4327-6	435 4327-7	437 4327-8	439 4327-9	431 4327-5	4356-5	443/446 4328-2	441	#3&4-82493 #5-82593 4356 4328	#5-82193 #5-82493 #182-82493 #384-82793
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	ш9/к	mg/kg	mg/kg	mg/kg	μg/L	J/6ri	µg/L	л6/г	mg/kg
DRPH	5-10	50-100	500 ^a	<503 < 100 ^b	_G D8 >	- 100 ₀	< 100°	åg.	<509	ΑN	41,000 ^b	¥	<1,000	<50
СЯРН	0.3-0.4	3.4	100	cap.<40	ا الله	<4. ¹⁷	g.V×	ene>	age v	¥.	cap.	, 20°	<1007	<2.1
RRPH (Approx.)	10	100	2,000 ⁸	goi.>	×100	c tDG	×100	×+00	<100	A A	<2,000	Ž	<2,000	<100
BTEX (8020/ 8020 Mod.)			10 Total BTEX	p2:0>-\$1:0>	<0.13	oë ¢>	020>	81.0>	<0.13					
Benzene	0.003-0.004	0.03-0.04	0.5	4005-c0.04	2002	<0.04	<0.04	<0.03	800%	<1 _C	ī	v	۲۷	<0.02
L	0.003-0.004	0.03-0.04		4005-c004	20.0×	<0.04	900×	BD:0>	×0.03	<10	Ţ	v		<0.02
Ethylbenzene	0.003-0.004	0.03-0.04		<0.03-<0.04	e0.03	\$0°C>	400>	<0.04	6003	<10	٧	v	⊽	<0.02
Xylenes (Total)	0.004-0.008	0.04-0.08		80.0>-60.0>	<0.0B	800×	800>	80 0>	<0.04	<2°	6	Q V	<2	×0.04
HVOC 8010	0.003-0.004	0.03-0.04		<0.03 <0.04	<0.03	40.0>	*0.04	20:0×	20'02	¥ Z	¥	V	₹	<0.02J
VOC 8260	0.020	0.030-0.150		<0.03-<0.150	<0.150	<0.070	<0.040	< 0.030	<0.050	<1-3.1	~	<1-12	₹	<0.020
SVOC 8270	0.200	6.9-15.0		<6.90-<15	<10	<15.0	<12.0	<6.90	<13.0	AA	>36	¥	<10	<0.200
Pesticides	0.002-0.05	0.02-0.5		50.02.1<0.50	-0.02J < 0.5J	<002J-<05J	<0.02J <0.5J	<0.02J <0.5J	<0.023 <0.54	NA	<0.23 < 50.1	Y.	NA	<0.01
PCBs	0.01	0.1	10	<0.1	+ Q >	¥0.5	502	-0°	100	ΑN	42	NA NA	<10	<0.5
702				57,000-69,300	69,300	NA	ΝΑ	57,000	68,100	Ą	AN	AN	<5,000	AA

CT&E Data. F&B Data.

F&B Data. Not analyzed. Result is an estimate.

The action levels for DRPH and RRPH are based on conversations with ADEC; final action levels have not yet been determined.

DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.

BTEX determined by 8260 method analysis.

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TABLE 2-3. BACKGROUND ANALYTICAL DATA SUMMARY (CONTINUED)

Parameters Detect. Limits Quant. Limits Action Levels Laboratory Sample ID Numbers mg/kg mg/kg mg/kg Aluminum 0.35 2 mg/kg Aluminum 0.024 1 mg/kg Arsenic 0.11 66-115 mg/kg Barium 0.024 1 mg/kg Cadmium 0.033 3.3.5.7 mg/kg Calcium 0.69 4 mg/kg Chromium 0.066 1 mg/kg Cobalt N/A 1-11 mg/kg Iron 0.045 1 mg/kg Iron 0.050 2 mg/kg Iron 0.045 1 mg/kg Manganesium 0.065 4 mg/kg Manganese 0.025 1 mg/kg	Bkgd. Range from 7 DEW Line Installations									
Parameters Detect. Limits Limits Quant. Limits Levels Laboratory Sample ID Numbers mg/kg mg/kg mg/kg ANALYSES mg/kg mg/kg mg/kg Aluminum 0.35 2 2 Antimony N/A 66-115 mg/kg Arsenic 0.024 1 66-115 Barium 0.024 1 66-115 Barium 0.033 3.3-5.7 2 Calcium 0.69 4 1 Cobalt N/A 1-11 1 Copper 0.045 1 1 Iron 0.045 1 1 Magnesium 0.096 4 4 Manganese 0.025 1 4	from 7 DEW Line Installations			Enviror	Environmental Samples	nples		Field Blank	Lab	۔ ۾
Laboratory Sample ID Numbers mg/kg mg/kg ANALYSES mg/kg mg/kg Aluminum 0.35 2 Arsenic 0.11 66-115 Arsenic 0.11 66-115 Barium 0.024 1 Cadmium 0.33 3.3-5.7 Chromium 0.69 4 Chromium 0.066 1 Cobalt N/A 1-11 Cobalt 0.045 1 Iron 0.045 2 Lead 0.13 2-11 Manganesium 0.056 4 Manganese 0.025 1		Point Lay Bkgd. Range	S01	S02	803	S04	SD01	EB01	DIBUKS	SE
MLYSES mg/kg mg/kg m 0.35 2 2 y N/A 66-115 y n 0.11 66-115 n 0.024 1 1 n 0.024 1 1 n 0.03 3.3-5.7 m 0.066 1 1 N/A 1-11 0.045 1 1 0.13 2-11 ium 0.96 4 1 1-11 0.050 2			4327-6	4327-7	4327-8	4327-9	4327-5	4328-2	4.4	4328
Aluminum 0.35 Antimony N/A Arsenic 0.11 Barium 0.024 Beryllium N/A Cadcium 0.69 Chromium 0.066 Cobalt N/A Iron 0.045 Iron 0.50 Lead 0.13 Magnesium 0.96 Manganese 0.025	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	μg/L	#	#g/L
Antimony N/A Arsenic 0.11 Barium 0.024 Beryllium N/A Cadmium 0.33 Chromium 0.066 Cobalt N/A Cobalt N/A Lead 0.045 Iron 0.50 Lead 0.13 Mangnesium 0.96 Manganese 0.025	1,500-25,000	9,700-23,000	23,000	9,700	17,000	19,000	19,000	<100	<u> </u>	5 5
Arsenic 0.11 Barium 0.024 Beryllium N/A Cadmium 0.33 Chromium 0.066 Cobalt N/A Copper 0.045 Iron 0.50 Lead 0.13 Magnesium 0.96 Manganese 0.025	<7.8-<230	<66-<115	<115J	<114	<79	99 >	<85J	<100	<u> </u>	200
Barjum 0.024 Beryllium N/A 1-5. Cadmium 0.33 3.3-5. Calcium 0.69 69 Chromium 0.066 Cobalt N/A 1-1 Copper 0.045 Iron 0.50 Magnesium 0.96 Manganese 0.025	<4.9-8.5	<66-<115	<115	<114	<79	99>	<85	<100	<u> </u>	210
Beryllium N/A 1-5. Cadmium 0.33 3.3-5. Calcium 0.69	27-390	170-390	390	170	260	290	340	<50		20
Cadmium 0.33 3.3-5. Calcium 0.69	<2.6-6.4	<4.0-4.2	<5.7	<5.7	<4.0	4.2	<4.3	<50	V	×50
Calcium 0.69 Chromium 0.066 Cobalt N/A 1-1 Copper 0.045 1-1 Iron 0.50 2-1 Magnesium 0.96 2-1 Manganese 0.025 3-1	<3.0-<36	<3.3-<5.7	<5.7	<5.7	<4.0	<3.3	<4.3	<50	<u> </u>	× 50
num 0.066 N/A 1-1 N/A 1-1 0.045 0.50 0.13 2-1 sium 0.96 nese 0.025	360-59,000	1,800-3,000	2,500	2,200	3,000	1,800	2,000	<200	V	×200
N/A 1-1 r 0.045 0.50 0.13 2-1 sium 0.96 nese 0.025	<4.3-47	16-37	37	16	28	31	33	<50		× 20
r 0.045 0.50 0.13 2-1 sium 0.96	<5.1-12	<7.9-7.3	<11	<11	<7.9	7.3	<8.6	<100	V	×100
0.50 0.13 2-1 ium 0.96 lese 0.025	<2.7-45	15-25	20	15	19	19	25	<50		² 50
0.13 2-1 lesium 0.96 anese 0.025	5,400-35,000	13,900-35,000	35,000	13,900	21,000	30,100	33,000	<100	<u> </u>	200
esium 0.96 anese 0.025	<5.1-22	<11-20	8	V-11	12	14	17	<100	<u> </u>	200
	360-7,400	2,500-4,400	4,300	2,500	4,400	4,000	3,800	<200	V	200
	25-290	73-110	97J	73	92	110	1007	<50		20
Molybdenum N/A 3.3-5.7	<2.5-<11	<3.3-<5.7	<5.7	<5.7	<4.0	<3.3	<4.3	<50		20
<u> </u>	4.2-46	19-27	56	19	56	25	27	<50		200
Potassium 23 100	<300-2,200	660-1,500	1,500	099	1,300	1,100	1,200	<5,000	<5,	<5,000

CT&E Data.
Not available.
Result is an estimate.

04 MARCH 1996

TABLE 2-3. BACKGROUND ANALYTICAL DATA SUMMARY (CONTINUED)

_													
<u> </u>	Installation: Point Lay	, (GD)	Matrix: Units:	Matrix: Soil/Sediment Units: ma/ka		METALS ANALYSES	ပ္သ						
	olle. Dackground (D	(25)		ò	Bkad, Range			Enviror	Environmental Samples	mples		Field Blank	Lab
1301\T	Parameters	Detect. Limits	Quant. Limits	Action Levels	from 7 DEW Line Installations	Point Lay Bkgd. Range	S01	S02	803	S04	SD01	EB01	Blanks
BL 2-3	Laboratory Sample						4327-6	4327-7	4327-8	4327-9	4327-5	4328-2	4328 4327
	ANALYSES	ma/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	η/gπ	µg/L
1	Selenium	1.2	66-115		<7.8-<170	<66-<115	<115	<114	<79	99>	<85	<100	<100
	Silver	0.53	33-57		<3-<110	<33-<57	<57R	<57	<40	<33	<43R	<507	<50
	Sodium	0.55	5		<160-680	110-174	170	120	140	110	174	<250	<250
1	Thallium	0.011	0.31-0.57		<0.2-<1.2	<0.31-<0.57	<0.57	<0.55	<0.36	<0.31	<0.40	\ \ \ \ \ \ \ \ \	<5
1	Vanadium	0.036	-		6:3-26	28-56	56	28	44	52	54	<50	<50
<u> </u> 2	Zine	0.16			9.2-95	26-48	46	56	48	44	48	<50	<50

CT&E Data. Result is an estimate. Result has been rejected.

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04 MARCH 1996

TABLE 2-3. BACKGROUND ANALYTICAL DATA SUMMARY (CONTINUED)

Parameters Detect. Limits Quant. Limits Numbers μg/L μg/L H 100 1,00 H 5 5 H (Approx.) 200 2,00 K (8020/8020 Mod.) 0.1 0.1 ene 0.1 0.1 nes (Total) 0.2 0.1 C 8010 0.1 0.2 C 8270 10 20-3 c 8260 1 20-3 cicides 0.2-5 2-5-6 icides 0.2-5 2-5-6		Installation: Point Lay Site: Background (BKGD)		Matrix: S Units: μg	Surface Water μg/L	_							-
Parameters Limits Acient Rigot SWOZ SWOZ 4456 Acient FEDIT TEDIT	1	1						Environmental Samp	les		Field Blanks		Lab
Laboratory Sample ID Numbers ASAL SEE 44814467 (4591467) 44814467 (4591467) 44814467 (4591467) 44814467 (4591467) 44814467 (4591467) 44814467 (4591467) 4481467 (459147) 4481467 (459147) 4481467 (459147) 4481467 (459147) 4481467 (459147) 4481467 (459147) 4481467 (459147) 4481467 (459147) 4481467 (459147) 4481467 (459147) 4481467 (459147) 4481467 (459147) 4481467 (459147) 4481467 (459147) 44814		Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Range	SW01	SW02		AB01	EB01	TB01	Digiliks
ANALYSES μg/L κg/L κg/L κg/L		Laboratory Sample ID Numbers					448/457 4328-5 4329-1	461/462 4328-8 4329-4		4356-5	443/446 4328-2	441	#5-82593 #3&4-82493 4356 4328 4328
OPPH 100 1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000 <1,000		ANALYSES	μg/L	μg/L	πg/L	μg/L	μg/L	μg/L		ηg/L	μg/L	η/βπ	μg/L
GAPH 5 50 -<60.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0 -<50.0	.1	ОВРН	100	1,000		-1,000 ^p	41,000°	<1,000°		NA	<1,000 ^b	Ϋ́	<1,000
RHPH (Approx) 200 2,000 C2,000 C2,000 C2,000 C2,000 C2,000 C2,000 C2,000 C2,000 NA C2,000	<u> </u>	GВРН	5	50		aros>	طر05>	_q ros>		NA	<501 _b	20°5	<1007
Benzene 0.1 1 5 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <th< td=""><td>1</td><td>RRPH (Approx.)</td><td>200</td><td>2,000</td><td></td><td><2,000</td><td><2,000</td><td><2,000</td><td></td><td>AN.</td><td><2,000</td><td>NA</td><td><2,000</td></th<>	1	RRPH (Approx.)	200	2,000		<2,000	<2,000	<2,000		AN.	<2,000	NA	<2,000
Benzene 0.1 1 5 41 <th< td=""><td>1</td><td>BTEX (8020/8020 Mod.)</td><td></td><td></td><td></td><td></td><td></td><td>000000000000000000000000000000000000000</td><td></td><td></td><td></td><td></td><td></td></th<>	1	BTEX (8020/8020 Mod.)						000000000000000000000000000000000000000					
Toluene 0.1 1,000 <1 <1 <1 <1,000 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	2-1	Benzene	0.1	-	5	7	₹	V		<1°		₹	
enzene 0.1 1 700 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <t< td=""><td> 5</td><td>Toluene</td><td>0.1</td><td>-</td><td>1,000</td><td>7</td><td>⊽</td><td>V</td><td></td><td>۲ ۲</td><td></td><td>₹</td><td>₹</td></t<>	 5	Toluene	0.1	-	1,000	7	⊽	V		۲ ۲		₹	₹
s (Total) 0.2 2 10,000 42	<u> </u>	Ethylbenzene	0.1	ļ	700	V	V	V		۸ <u>۲</u>		⊽	₹
8010 0.1 1 4 41 41 41 41 41 41 41 41 41 41 41 41 41 41 41 41 41 41-12	<u> </u>	Xylenes (Total)	0.2	2	10,000	82	22	<2		<2°	42	Ñ	<2
260 1		HVOC 8010	0.1	-		<1	Ÿ	7		Ϋ́	₩.	Ÿ	₹
8270 10 20-31 < 20-<31 < 31 < 20 NA < 36 NA < 36 NA All NA NA All NA	<u></u>	VOC 8260	-	-				\ -		<1-3.1	▼	<1-12	₹
ides 0.2-5 2-50 <0.2J-<50J <0.2J-<50J <0.2J-<50J <0.2J-<50J <0.2J-<50J NA <0.2J-<50J NA 0.2 2 0.5 -<2	\	SVOC 8270	9	20-31		<20-<31	<31	<20		AN	<36	¥.	<10
0.2 2 0.5 <2 <2 NA <2 NA NA S	<u> </u>	Pesticides	0.2-5	2-50		<0.2J-<50J	<0.2J-<50J	<0.2.L<50.J		A N	<0.24<50.1	Y.	NA
	-	PCBs	0.2	2	0.5	<2	<2	<2		NA	<2	ΑN	<10

CT&E Data. F&B Data.

Not analyzed. Result is an estimate. DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC. BTEX determined by 8260 method analysis.

TABLE 2-3. BACKGROUND ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Site: Background (BKGD)	_	Matrix: Sι Units: μg	Matrix: Surface Water Units: µg/L								
					ш I	Environmental Samples	nples		Field Blanks		Lab
Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Range	SW01	SW02		AB01	EB01	TB01	Bianks
Laboratory Sample ID Numbers					448/457 4328-5 4329-1	461/462 4328-8 4329-4		4356-5	443/446 4328-2	441 4328-1	4356 4328 4329
ANALYSES	#g/L	η/βπ	μg/L	J/B#	η/Bπ	J/6#		μg/L	μg/L	μg/L	#g/L
100	5,000	5,000		31,700-40,000	40,000	31,700		NA	NA	AN	<5,000
TSS	100	200		6,000-77,000	6,000	77,000		NA	AN.	AN A	<100
TDS	10,000	10,000		149,000-151,000	149,000	151,000		NA	NA	ΑN	<10,000

CT&E Data. Not analyzed.

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04 MARCH 1996

TABLE 2-3. BACKGROUND ANALYTICAL DATA SUMMARY (CONTINUED)

Parameters Detect. Limits Quant. Limits Laboratory Sample ID Numbers μg/L μg/L Aluminum 17.4 100 Antimony N/A 100 Arsenic 5.3 100 Barium 1.2 50 Beryllium N/A 50	Action Levels μg/L								
N/A	Action Levels µg/L	Bkgd. Range	Point Lay Bkgd.		Environmental Samples	Samples	Field	Field Blank	Lab
y Sample mbers μg/L. ΥSES μg/L 17.4 17.4 N/A N/A N/A N/A N/A	η/βπ	from 7 DEW Line Installations	Range	SW01	SW02		Ш	EB01	Blanks
YSES μg/L 17.4 N/A 5.3 5.3 N/A	ηâ/Γ			4329-1 4328-5	4329-4 4328-8		4	4328-2	4329
17.4 N/A 5.3 1.2		πg/L	η/Bπ	η/6π	η/bπ			μg/L	μg/L
N/A 5.3 1.2 N/A		<100-350 (<100-340)	130-350 (<100-340)	350 (340)	130 (<100)			<100	<100
5.3 1.2 N/A	9	<100 (<100)	<100 (<100)	<100 (<100)	<100 (<100)			<100	× 100
1.2 N/A	50	<100 (<100)	<100 (<100)	<100 (<100)	<100 (<100)			<100	v 100
N/A	2,000	<50-93 (<50-91)	51-56 (<50)	51 (<50)	56 (< 50)			<50	<50
	4	<50 (<50)	<50 (<50)	<50 (<50)	<50 (<50)			<50	× 20
Cadmium 1.7 50	S	<50) (<50)	<50 (<50)	<50 (<50)	<50 (<50)			<50	× 50
Calcium 34.5 200		4,500-88,000 (4,100-86,000)	5,500-9,000	5,500	9,000			<200	<200
Chromium 3.29 50	100	<50 (<50)	<50 (<50)	<50 (<50)	<50 (<50)			<50	<50
Cobalt N/A 100		<100 (<100)	<100 (<100)	<100 (<100)	<100 (<100)			<100	× 100
Copper 2.3 50	1,300	<50 (<50)	<50 (<50)	<50 (<50)	<50 (<50)			<50	× 50
lron 25 100		180-2,800 (<100-1,600)	2,000-2,800 (950-1,600)	2,000 (1,600)	2,800 (950)			<100	× 100

☐ CT&E Data. N/A Not available.

TABLE 2-3. BACKGROUND ANALYTICAL DATA SUMMARY (CONTINUED)

Parameters Detect. Laboratory Sample ID Numbers ANALYSES µg/L Lead 6.6	Quant.	187			2000				
arameters Del	Quant. Limits						0 1-4	Cield Blonk	, da l
arameters Del	Quant. Limits		Bkgd. Range	Point Lay Bkgd.		Environmer	Environmental Samples	LIGIO DIGILIA	Blanks
ratory Sample O Numbers NALYSES		Action Levels	from / DEW Line Installations	range	SW01	SW02		EB01	
INALYSES					4329-1 4328-5	4329-4 4328-8		4328-2	4329 4328
	#g/L	πg/L	µg/L	η/6π	η/Bπ	μg/L		πg/L	μg/L
	100	15	<100 (<100)	<100 (<100)	<100 (<100)	<100 (<100)		<100	<100
Magnesium 47.8	200		<5,000-53,000 (2,600-54,000)	<5,000-5,500 (<4,900-5,500)	5,000 (4,900)	5,500		<200	<200
Мапдалеѕе 1.24	9		<50-510 (<50-120)	120-510 (66-120)	120 (120)	510 (66)		<50	<50
<u></u>	50		<50) (<50)	<50 (<50)	<50 (<50)	<50) (<50)		<50	<50
	90	100	<50 (<50)	<50 (<50)	<50 (<50)	<50) (<50)		<50	< 50
ium 1,	5,000		<5,000 (<5,000)	<5,000 (<5,000)	<5,000 (<5,000)	<5,000 (<5,000)		<5,000	<5,000
Selenium 62.4	100	50	<100 (<100)	<100 (<100)	<100 (<100)	<100 (<100)		<100	× 100
Silver 2.6	20	50	<50 (<50)	<50 (<50)	<507 (<50) J	<50 (<50)		<507	× 20
Sodium 27.7	550		8,400-410,000 (8,200-450,000)	17,000-18,000 (17,000-19,000)	17,000 (17,000)	18,000 (19,000)		<250	<250
Thallium 0.57	5	8	<5 (<5)	<5 (<5)	<5 (<5)	<5 (<5)		<5	<5

CT&E Data.
Not available.
Result is an estimate.

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TABLE 2-3. BACKGROUND ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay	(JE)	Matrix: Units:	Matrix: Surface Water Units: 4/2/		METALS ANALYSES: TOTAL (DISSOLVED)	; TOTAL (DISSOLVED	=			-	
			ò	3kgd. Range			l	Environmental Samples	Field Blank	ınk	Lab
Parameters	Detect. Limits	Quant. Limits	Action Levels	from 7 DEW Line Installations		SW01	SW02		EB01		Dianks
Laboratory Sample ID Numbers						4329-1 4328-5	4329-4 4328-8		4328-2	8	4329 4328
ANALYSES	μg/L	μg/L	#B/L	πg/L	πg/L	η/Bπ	η/6π		μg/L	اہے	μg/L
Vanadium	1.8			<50 (<50)	<50 (<50)	<50 (<50)	<50) (<50)		<50	Q	<50
Zinc	8.2	50		<50-160 (<50)	<50 (<50)	<50 (<50)	160 (<50)		<50	o.	<50

CT&E Data.

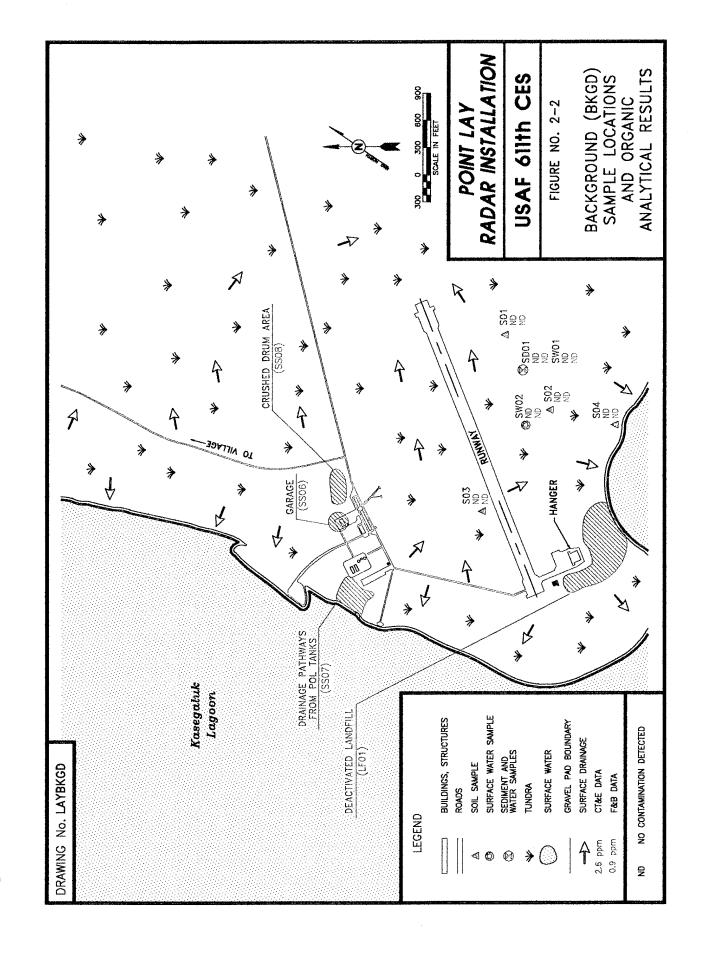


TABLE 2-4. ANALYTICAL METHODS AND TOTAL NUMBER OF SOIL ANALYSES

LAY\410	SOIL ANALYSES ^a	ANALYTICAL METHOD	REPORTING UNITS	NUMBER OF ANALYSES	REPLICATES	TOTAL ANALYSES
ـــــال	VOC 8260	SW5030/8260	mg/kg	21	2	23
1	SVOC	SW3550/8270	mg/kg	13	 -	14
	Total Metals Analysis ICP Screen	SW3050/6010	mg/kg	10	-	11
<u> </u>	TOC, Soil	0906MS	mg/kg	4	-	5
<u> </u>	TPH ^b - Diesel Range	SW3510/3550/8100M	mg/kg	09	9	99
1	TPH - Gasoline Range	SW5030/8015M	mg/kg	09	9	99
	TPH - Residual Oil	SW3510/3550/8100M	mg/kg	41	4	45
	втех	SW5030/8020/8020M	mg/kg	20	5	55
•	HVOC 8010M	SW5030/8010	mg/kg	37	4	41
	PCB	SW5030/8080/8080M	mg/kg	37	4	41
 23	Pesticides	SW5030/8080/8080M	mg/kg	10	2	12
	TOTAL SOIL ANALYSES			343	36	379
	TOTAL SOIL SAMPLES			90	9	99
4						

Modified. Includes soil and sediment analyses. TPH = Total Petroleum Hydrocarbon.

∑ 5 0

TABLE 2-5. ANALYTICAL METHODS AND TOTAL NUMBER OF WATER ANALYSES

SVOC SW35030/9280 μg/L 6 SVOC SW3500/6010 μg/L 6 Total Metals Analysis SW3005/6010 μg/L 5 LICP Screen SW3005/6010 μg/L 5 Dissolved Metals Analysis SW3005/6010 μg/L 5 TOC, Nonpurgable SW3005/6010 μg/L 5 Residue, Filterable (TDS) E 160.1 μg/L 5 Residue, Filterable (TDS) E 160.1 μg/L 5 TPH - Diesel Range SW3510/3550/8100M μg/L 5 TPH - Gasoline Range SW3510/3550/8100M μg/L 17 BTEX SW5030/8020/8020/80 μg/L 17 Halogenated Volatile SW5030/8020/8080/8080M μg/L 16 PCB SW5030/8080/8080M μg/L 3	1/6π 1/6π 1/6π		BLANKS	BLANKS	DUPLICATES	ANALYSES
ysis SW3550/8270 μg/L ysis SW3005/6010 μg/L SS) E 160.2 μg/L DS) E 160.1 μg/L ps/L μg/L κg/L sw3510/3550/8100M μg/L βg/L sw3510/3550/8100M μg/L βg/L sw5030/8020/8020M μg/L μg/L sw5030/8080/8080M μg/L μg/L sw5030/8080/8080M μg/L μg/L sw5030/8080/8080M μg/L μg/L	7/6π 7/6π	3	-	3	-	19
lysis SW3005/6010 μg/L SS) E 160.2 μg/L DS) E 160.1 μg/L e SW3510/3550/8100M μg/L e SW3510/3550/8100M μg/L sw3510/3550/8100M μg/L sw5030/8020/8020M μg/L sw5030/8080/8080M μg/L sw5030/8080/8080M μg/L sw5030/8080/8080M μg/L	Л/В#	0	0	2	-	6
SW3005/6010 μg/L E 160.2 μg/L E 160.1 μg/L SW3510/3550/8100M μg/L SW5030/8015M μg/L SW5030/8020M μg/L SW5030/8020M μg/L SW5030/8080M μg/L SW5030/8080/8080M μg/L		0	O	2	-	ω .
(TSS) E 160.2 μg/L (TDS) E 160.1 μg/L μg/L sqe SW3510/3550/8100M μg/L βg/L sw3510/3550/8100M μg/L μg/L sw5030/8020/8020M μg/L μg/L sw5030/8080/8080M μg/L μg/L sw5030/8080/8080M μg/L μg/L sw5030/8080/8080M μg/L μg/L	#8/L	0	0	-	-	7
E 160.2 μg/L SW3510/3550/8100M μg/L SW3510/3550/8100M μg/L SW5030/8020/8020M μg/L SW5030/8080/8080M μg/L SW5030/8080/8080M μg/L SW5030/8080/8080M μg/L	η/6π	0	0	0	-	9
E 160.1 μg/L SW3510/3550/8100M μg/L SW3510/3550/8100M μg/L SW5030/8020/8020M μg/L SW5030/8080/8080M μg/L SW5030/8080/8080M μg/L	μg/L	0	0	0	-	9
ge SW3510/3550/8100M μg/L βg/L SW5030/8015M μg/L μg/L SW5030/8020/8020M μg/L μg/L s SW5030/808010M μg/L s SW5030/8080/8080M μg/L s SW5030/8080/8080M μg/L	μg/L	0	0	0	-	9
ge SW5030/8015M μg/L SW3510/3550/8100M μg/L s SW5030/8020/80 s SW5030/8080/80 s kg/L s kg/L s kg/L s kg/L sW5030/8080/8080M μg/L	μg/L	0	0	2	0	26
Residual Oil SW3510/3550/8100M μg/L enated Volatile SW5030/8020/8020M μg/L iic Compounds SW5030/8080/8080M μg/L sw5030/8080/8080M μg/L sides SW5030/8080/8080M μg/L	ηð/F	8	0	2	a	28
enated Volatile SW5030/8020/8020M μg/L iic Compounds SW5030/8080/8080M μg/L SW5030/8080/8080M μg/L ides SW5030/8080/8080M μg/L	ηð/F	0	0	2	8	21
SW5030/8010M μg/L sw5030/8080/8080M μg/L μg/L sw5030/8080/8080/8080M	μg/L	2	0	2	2	23
SW5030/8080/8080Μ μg/L 1	μg/L	α	0	2	-	21
SW5030/8080/0808/L	μg/L	0	0	2		14
	μg/L	0	0	2		9
TOTAL WATER ANALYSES 150	150	6	-	22	18	180
TOTAL WATER SAMPLES 22	22	3	-	3	2	31

presents a description of the water analytical methods and the number of surface water samples collected during the RI.

2.3.3.1 Analytical Program. Analyses of samples were conducted by a fixed laboratory in Anchorage, Alaska, and a temporary laboratory set up at Barrow, Alaska. The analytical testing conducted by each laboratory is discussed below.

The fixed laboratory in Anchorage, Alaska, was operated by Commercial Testing & Engineering (CT&E). CT&E analyzed samples as follows:

Analyses	Analytical Method
Volatile Organic Compounds	SW5030/8260
Metals	SW3050 (Soil) 3005 (Water)/6010
Semi-Volatile Organic Compounds	SW3550 (Soil) 3510 (Water)/8270
Total Dissolved Solids	E160.1
Total Suspended Solids	E160.5
Total Organic Carbon	SW9060
Moisture Content	ASTM D 2216
Toxicity Characteristic Leaching Procedure (TCLP)	SW1311

In addition, for the first few weeks of the field activities, CT&E provided the following analyses on a quick turnaround basis:

<u>Analyses</u>	<u>Analytical Method</u>
Halogenated Volatile Organic Compounds	SW5030/8010
Benzene, Toluene, Ethylbenzene, and Xylenes	SW5030/8020
Gasoline Range Petroleum Hydrocarbons	8015 Modified
Diesel Range Petroleum Hydrocarbons	8100 Modified
Polychlorinated Biphenyls/Pesticides	SW5030/8080

The temporary laboratory in Barrow, Alaska, was operated by Friedman & Bruya (F&B) of Seattle. F&B analyzed samples for the following constituents:

Analyses	Analytical Method
Halogenated Volatile Organic Compounds	SW5030/8010 Modified
(four compounds only)	
Benzene, Toluene, Ethylbenzene, and Xylenes	SW5030/8020 Modified
Polychlorinated Biphenyls/Pesticides	SW3550/8080 Modified
Diesel Range Organics (DRO)	8100 Modified
Gasoline Range Organics (GRO)	8010/8020/8015 Modified
Residual Range Organics	8100 Modified

Analytical methods used during sample analyses for this project are summarized in Tables 2-4 and 2-5 and are developed from the reference methods described in the following sources:

- Test Methods for Evaluating Solid Waste (Physical/Chemical Methods) Third Edition, EPA SW-846. September 1986.
- Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020.
 March 1983.
- Standard Methods for the Examination of Water and Wastewater, APHA/AWWA, 17th Edition. 1989.
- Interim Guidance for Non-UST Soil Cleanup Levels, Alaska Department of Environmental Conservation. July 1991.

Project-specific analytical methods and procedures, target analytes, quantitation limits, and acceptance criteria are presented in the RI/FS SAP (U.S. Air Force 1993b).

2.3.4 Chronology of Laboratory Analyses

Laboratory analyses conducted by the temporary laboratory, F&B, in Barrow, Alaska, were conducted on a quick-turnaround basis. The samples collected at Point Lay radar installation were analyzed by this laboratory during the period from 24 August to 27 August 1993.

Analyses at the CT&E laboratory in Anchorage, Alaska, were conducted between 26 August and 26 October 1993. These analyses included a few quick-turnaround analyses and primarily standard-turnaround analyses.

2.3.5 Laboratory QA/QC Programs

The quality assurance (QA) objectives for this project were achieved through implementation of specific procedures for sampling, chain-of-custody, calibration, laboratory analyses, data validation and reporting, internal QC, audits, preventive maintenance, and corrective actions.

A detailed description of QA/QC measures, frequency, and corrective actions used by both labs is presented in the Quality Assurance Project Plan (QAPjP) [Section 1 of the RI/FS SAP (U.S. Air Force 1993b)]. Ultimately, the relevant laboratory standard operating procedures (SOPs) provide full and detailed guidance regarding all method-specific laboratory QA/QC criteria and appropriate corrective actions.

Data quality for the organic analyses was monitored by the laboratory through a QA program that included analyses of initial and continuing calibrations, method blanks, surrogate spikes, internal standards, matrix spikes, matrix spike duplicates, and laboratory control samples. The identification of target analytes at levels above the detection limit was confirmed by gas chromatography/mass spectrometry (GC/MS) or analysis on a gas chromatograph (GC) equipped with a different column (second column confirmation).

Data quality for the inorganic analyses was monitored through a QC program that included analyses of initial and continuing calibrations, laboratory control samples, method blanks, duplicate samples, post-digestion analytical spikes, and matrix spikes.

Laboratory QC samples were analyzed at a rate of at least one per 20 determinations. See the RI/FS QAPjP for laboratory-specific criteria for the frequency of QC sample analyses and corrective actions regarding QC analyses.

2.3.6 Data Validation and Reporting

Data validation is a systematic process of reviewing a group of sample data to provide assurance that the data are adequate for their intended use. The validation activities were performed in accordance with the following EPA documents to the extent that they were applicable:

- Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses.
 EPA. Hazardous Site Evaluation Division. December 1990.
- Laboratory Data Validation Guidelines for Evaluating Inorganic Analyses. EPA.
 Hazardous Site Evaluation Division. October 1989a.
- Test Methods for Evaluating Solid Waste (Physical/Chemical Methods) Third Edition, EPA SW-846. September 1986.

Prior to releasing data for use by project staff, selected data packages underwent a formal validation procedure to examine laboratory compliance with QA requirements and other factors that determine the quality of the data. The organic validation was performed by the prime contractor in accordance with the EPA Functional Guidelines for Evaluating Organic Analyses. The following factors were examined:

- Sample holding times;
- Sample chain-of-custody;
- GC/MS tuning criteria;
- Initial and continuing calibration;
- Method blanks;
- Practical quantitation limits;
- Laboratory blank contamination;
- Surrogate spike recoveries;
- Matrix spike/duplicate analysis;
- Field duplicate analysis;
- Ambient condition blank contamination;
- Trip blank contamination;
- Internal standard area;
- Pesticide instrument performance;
- Compound identification criteria; and
- Analyte identification and quantitation.

The inorganic data validation was performed in accordance with the EPA Functional Guidelines for Evaluating Inorganic Analyses. Parameters evaluated include:

- Holding time;
- Blank results;
- Instrument calibration;
- Inductively coupled plasma (ICP) spectroscopy interference check analysis;
- Laboratory control samples;
- Duplicate analysis;
- Spike analyses;
- Furnace analyses (spikes and duplicates);
- Serial dilution:
- Detection limits; and
- Analyte quantitation.

When a data package was received from the laboratory, the analytical results and associated QA/QC documentation were reviewed for technical compliance, and data validation reports were prepared summarizing the QA/QC parameters that were reviewed. The review included evaluation of laboratory and field blank sample data, and review of all data for accuracy, precision, and completeness.

A cross-section of CT&E analytical data, representing approximately 15 percent of all the CT&E analyses, underwent formal data validation. Because some reporting errors were found in the F&B analytical data, 100 percent of the F&B data was validated. Once the validation for a batch of samples was completed, a validation report was prepared. The report highlights all the QC criteria evaluated, and notes any major deficiencies or QA problems. Although a minimal amount of analytical data was rejected during data evaluation, the acceptable and valid data from CT&E and F&B are sufficient to meet the project objectives. The data validation reports for data generated by CT&E and F&B are presented in Appendix G.

2.4 METHODOLOGY FOR RISK ESTIMATION

This section describes the methods used to determine the potential risks to human and ecological receptors from chemicals detected in samples collected from the four sites at the installation. A summary of the risks posed by chemicals detected at each of the sites is presented on a site-by-site basis in Section 3.0. The complete human health and ecological risk assessments (ERAs) are presented in the Point Lay Risk Assessment (U.S. Air Force 1996), which has been submitted under separate cover.

In addition to the methods for risk evaluation, this section presents contaminant fate and transport, general potential migration pathways, and receptor groups common to all of the four Point Lay sites.

2.4.1 Human Health Risk

The evaluation of human health risk is conducted in accordance with standard risk assessment methodology as described in *Risk Assessment Guidance for Superfund (RAGS): Human Health Evaluation Manual, Part A* (EPA 1989a), *Region 10 Supplemental Risk Assessment Guidance for Superfund* (EPA 1991a), and the *Handbook to Support the Installation Restoration Program Statements of Work* (U.S. Air Force 1991a). This section presents a summary of the approach used in evaluating the human health risks associated with the sites at the Point Lay radar installation.

The Point Lay DEW Line installation presented a unique challenge to the development of a human health risk assessment. Many of the conventional assumptions applied to risk assessments do not apply to the North Slope of Alaska. Point Lay is remote and sparsely populated. Native residents from surrounding areas, largely Inupiats, follow a lifestyle that includes a significant subsistence component; much of their food consists of mammals (whales, seals, and caribou), aquatic life (arctic char), and birds (ptarmigan and ducks) that are abundant in this area of the arctic. The climate is generally harsh, and the soil and surface water are frozen for approximately nine months of the year. The following paragraphs present some of the approaches and assumptions used in the development of the human health risk assessment.

The general approach to the human health risk assessment was to quantify the excess lifetime cancer risk and the noncancer hazard associated with exposure to the site contaminants detected at each of the four sites at the installation. The maximum concentration of each chemical detected was used as the exposure point concentration instead of an arithmetic mean or 95th percentile upper confidence limit (UCL) because contamination was infrequently detected and found to be generally of low concentration. Incorporating nondetects into the calculation of an average or UCL when the frequency of positive detects is low tends to yield low and unreliable estimates of contamination. Use of the maximum concentration yields a more conservative estimate of risk or hazard.

Chemical concentrations detected in soil, sediment, or surface water samples from each of the sites were compared to risk-based screening levels (RBSLs), ARARS, and background concentrations. A chemical was selected as a COC if the maximum concentration at which the chemical was detected exceeded the corresponding background concentration, and the RBSL (based either on cancer risk or noncancer hazard) or an ARAR. In addiction, chemicals detected above background levels were retained as COCs if no RBSL or ARAR was available. COCs selected in this manner were evaluated in the human health risk assessment.

An exposure pathway describes the course a chemical will take from a source to an exposure point where a receptor can come into contact with the chemical. The exposure pathways by which exposure to the COCs at Point Lay may occur include ingestion, dermal contact, and inhalation. The dermal contact and inhalation pathways were not considered complete or significant because the arctic climate precludes dermal contact with and volatilization of site contaminants, so they were not evaluated. Exposure pathways that were considered for all sites were incidental ingestion of soil/sediment and ingestion of surface water.

Three potential receptor groups were evaluated in the risk assessment: an adult assigned to a DEW Line installation (worker), an adult inhabitant of a community on the North Slope of Alaska (native), and a child living in a North Slope community (child).

The risk assessment assumed a residential scenario when estimating the soil/sediment and water ingestion rates. The soil/sediment ingestion rate was based on EPA default values, 100 mg/day for adults and 200 mg/day for children. The drinking water ingestion rate assumed a potential future scenario where the surface water where chemicals were detected at the site will be used as a source of drinking water for 180 days per year at the EPA default ingestion rate of 2 liters per day.

The exposure duration assumed a DEW Line worker would be stationed at the Point Lay installation for 10 years. The exposure duration for the native was estimated to be 55 years. EPA's default reasonable maximum exposure duration is 30 years; however, this is based on the residence time in one location for the continental United States. Because Alaskan natives are more likely to remain in North Slope communities for a longer period, 55 years was determined to be a more appropriate estimate of residence time.

The risk assessment was based on the assumptions just described, along with chemical-specific toxicity data, to quantitatively and qualitatively express the hazards and risks. To characterize potential noncancerous effects, comparisons were made between projected intakes of the COCs and chemical-specific toxicity values. The potential noncancerous health effects were expressed as a hazard quotient (HQ). To assess the overall potential for noncancerous effects posed by more than one chemical at a site, the HQs were summed and reported as the hazard index. An HQ or hazard index of 1.0 is the regulatory benchmark. Noncancer hazards greater than 1.0 are generally considered a concern, and noncancer hazards of less than 1.0 are generally considered to not warrant further evaluation.

To characterize the potential for carcinogenic effects, the probability that an individual will develop cancer over a lifetime of exposure, the risks were estimated from projected intakes of the COCs and chemical-specific dose-response information. The cancer risks are calculated on a chemical-specific basis and are added together (if more than one chemical associated with cancer risk is a COC at the site) to estimate the total cancer risk for the site. The total cancer risk for each pathway is generally not considered to be of concern unless it exceeds a value of 1×10^{-6} (EPA 1991b).

Excess lifetime cancer risk is the incremental increase over and above the background (i.e., if no exposure to site chemicals occurs) in the probability of developing cancer during one's lifetime. For example, a 1 x 10⁻⁶ excess lifetime cancer risk means that, in a population of one million people exposed to the carcinogen throughout their lifetimes, the average incidence of cancer may increase by one case. The background probability among Americans of developing cancer at some time in their lives is about one in four (American Cancer Society 1993). The calculation of cancer risks uses information (i.e., cancer slope factors) developed by the EPA that represents upper bound estimates, so any cancer risks estimated in the risk assessment should be regarded as upper bounds on the potential cancer risks rather than accurate representations of true cancer risk. The true cancer risk is likely to be lower than that predicted (EPA 1989a).

Excess lifetime cancer risk and noncancer hazard were calculated for the soil/sediment ingestion and water ingestion pathways. Other pathways were eliminated from consideration as described in the Point Lay Risk Assessment (U.S. Air Force 1996). The risks and hazards associated with chemicals detected at the Point Lay sites are presented on a site-by-site basis in Section 3.0 of this RI/FS report.

2.4.2 Ecological Risk

The objective of the ERA is to estimate potential impacts to aquatic and terrestrial plants and animals at the Point Lay DEW Line installation. The evaluation of environmental risks was conducted in accordance with current Air Force and EPA guidance, specifically, *Handbook to Support the Installation Restoration Program Statements of Work* (U.S. Air Force 1991), *Framework for Ecological Risk Assessment* (EPA 1992), and *Ecological Risk Assessment Guidance for Superfund* (EPA 1994).

The approach used to assess potential ecological impacts was conceptually similar to that used to assess human health risks. Potentially exposed populations (receptors) were identified, and information on exposure and toxicity was combined to derive estimates of risk. However, the scope of ERAs is generally different from that of human health risk assessments in that ecological assessment focuses on potential impacts to a population of organisms rather than to individual organisms (except in the case of endangered species where individuals are considered). In addition, because ecosystems are composed of a variety of species, ecological assessments evaluate potential impacts to numerous species instead of a single species (as is the case in human health assessments).

Ideally, ERAs should evaluate potential risks to communities and ecosystems, as well as to individual populations. However, because of the large number of species and communities present in natural systems, such ecosystem-wide assessments are very complex and appropriate assessment methodologies have not yet been developed. In addition, dose-response data on community or ecosystem responses are generally lacking. Therefore, evaluations of potential impacts to communities or ecosystems are qualitative.

The degree to which potential ecological impacts can be characterized is highly dependent upon the data available to support such estimates. Data required include: information regarding contaminant release, transport, and fate; characteristics of potential receptor populations; and adequate supporting toxicity data for the COCs. The degree to which the existing database can meet these requirements dictates the extent to which potential ecological impacts can be evaluated.

Ecological receptors can be exposed to COCs through abiotic and biotic media. Potential exposure pathways for terrestrial and aquatic organisms include direct contact and ingestion of contaminated soil/sediment and/or surface water. The most significant route of exposure for plants is direct contact with soil. Aquatic organisms such as fish and invertebrates are primarily exposed through direct contact with surface water, but may be exposed to COCs through ingestion of plant and animal items in the diet, and incidental ingestion of soil/sediment while foraging (although only direct contact with surface water is used to develop risk estimates). Birds

and mammals may be exposed to COCs through ingestion of surface water, ingestion of plant and animal diet items, and incidental ingestion of soil/sediment.

The potential ecological receptors evaluated in the risk assessment include plants, aquatic organisms, birds, and mammals likely to occur along the Arctic Coastal Plain. Representative species from these groups of receptors were selected based primarily on the species' likelihood of exposure given their preferred habitat and feeding habits. Species that may be particularly sensitive to environmental impacts, such as endangered or threatened species, were also evaluated. The representative species are presented in Table 2-6. Any threatened or endangered species evaluated in the ERA are not considered representative of the Arctic Coastal Plain or the DEW Line installations. These species are evaluated to provide information about whether they face potential risks from exposure to COCs.

Potential risks to representative species were estimated by evaluating sampling data for the relevant exposure media (i.e., soil/sediment and surface water). Potential risks to plants were evaluated based on a comparison of the average contaminant concentrations in the site soil/sediment via toxicity information in the literature. Potential impacts on aquatic receptors were evaluated by comparing average surface water concentrations to toxicity reference values (TRVs). Potential impacts to birds and mammals were evaluated for selected representative species by comparisons of estimated exposures, based on potential dietary intakes of COCs, to TRVs. TRVs for representative species are derived by selecting toxicity values from the literature and extrapolating to the species of concern. TRVs are then divided into the estimated exposure concentration to derive the HQ. If the HQ is less than one, then adverse effects are not expected. Conversely, if the HQ is equal to or greater than one a potential for adverse effects exists. The confidence level of the risk estimate is increased as the magnitude of the HQ departs from 1.0. For example, there is greater confidence in a risk estimate where the HQ is 0.1 or 10, than in an HQ such as 0.9 to 1.1.

TRVs are calculated to be protective for long-term exposures. This is accomplished by using chronic chemical and receptor-specific no-effect dosages as starting points when such data is available. If chronic or receptor-specific data is not available, then uncertainty and scaling factors (to account for differences in body size) are incorporated in the derivation of the TRVs. This is standard practice in ERAs and is illustrated in screening level benchmarks used in the ERA for sediments (Hull and Suter 1994), aquatic biota (Suter and Mabrey 1994), and wildlife (Opresko et al. 1994). The assumptions incorporated in the ERA assume daily exposure during the receptor's most sensitive life stage (i.e., one breeding season). Consequently, if no risks are identified at the "chronic" level, there will be no risk related to "acute", or occasional exposures. This should be kept in mind when interpreting the HQ. Although the HQ may be greater than one, the conservatism embodied in the TRV, and assumptions of the ERA, allow for mitigating factors (e.g., large home range, short seasonal exposure, unlikely repeated exposures at a "hot spot" location) that may result in a finding of no significant risk.

The ERA was intended to be at a screening level, rather than a full scale investigation of the state of the ecosystem. No specific onsite studies of the biota were undertaken. The assessment was based on media sampling (i.e., surface water and soil/sediment samples). The ecological risks associated with the chemicals detected at the Point Lay sites are presented site-by-site in Section

TABLE 2-6. REPRESENTATIVE SPECIES AT THE DEW LINE INSTALLATION SITES

COMMON NAME	GENUS AND SPECIES
Sedge	Carex spp.
Cottongrass	Eriophorum spp.
Willow	Salix spp.
Berries	Vaccinium spp.
Water fleas	Daphnia spp.
Nine-spined stickleback	Pungitius pungitius
Arctic char	Salvelinus alpinus
Lapland longspur	Calcarius Iapponicus
Brant	Branta bernicla
Glaucous gull	Larus hyperboreus
Pectoral sandpiper	Calidris melanotos
Brown lemming	Lemmus trimucronatus
Arctic fox	Alopex lagopus
Barren-ground caribou	Rangifu tarndus
Spectacled eider ^a	Somateria fischeri
Steller's eider ^b	Polysticta stelleri

a threatened status

b candidate for threatened status

3.0 of this RI/FS report. The complete ERA is presented in the Section 3.0 of the Final Point Lay Risk Assessment (U.S. Air Force 1996).

2.4.3 Contaminant Fate and Transport

The fate and transport of the COCs in soil/sediment, active layer water, and surface water have been accounted for in the sampling plan. Known source areas were sampled, and the extent of migration was evaluated by sampling at increasing distances from the source area. Surface and subsurface sampling was conducted in gravel pads and tundra areas to characterize the extent of contaminant migration. Groundwater was not evaluated because subsurface water flow occurs only in the active layer over the permafrost, and groundwater is not used for domestic purposes. Water samples were collected from streams and ponds and analyzed to evaluate the migration of contamination from source areas to water bodies potentially used by human or ecological receptors. The potential for contaminant migration is discussed on a site-specific basis in Section 3.0.

2.4.4 General Migration Pathways

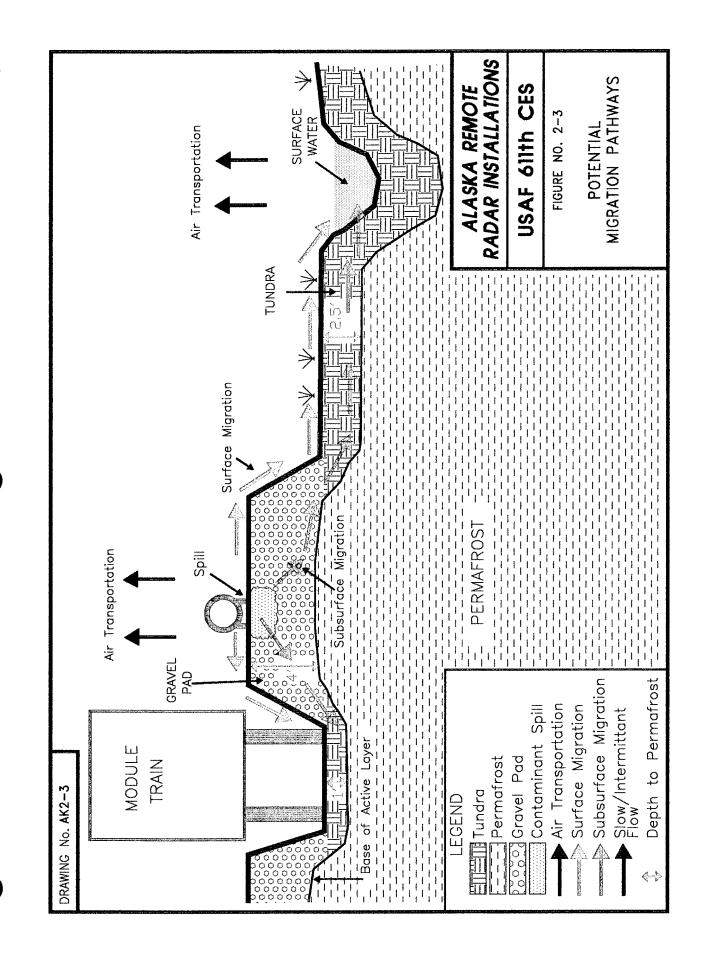
This section presents general information concerning migration pathways for the four sites at the Point Lay radar installation. Site-specific migration pathways are discussed in Section 3.0.

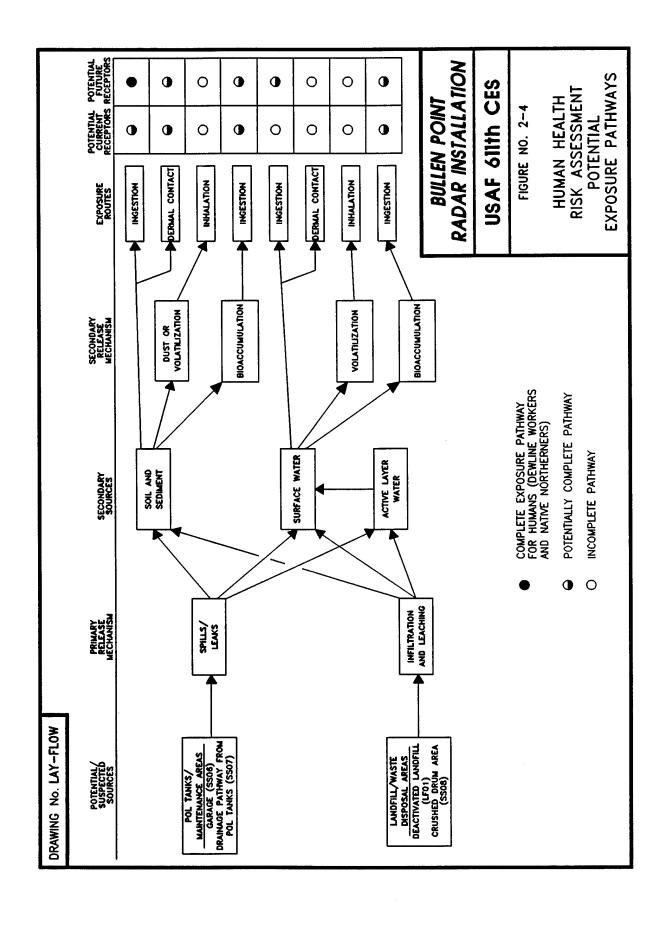
The potential for contaminant migration exists for any site where a release has occurred. The threat that a contaminated site presents to human health or the environment was assessed according to the potential for contaminant migration, human or ecological receptors, and contaminant concentrations to which the receptors may be exposed.

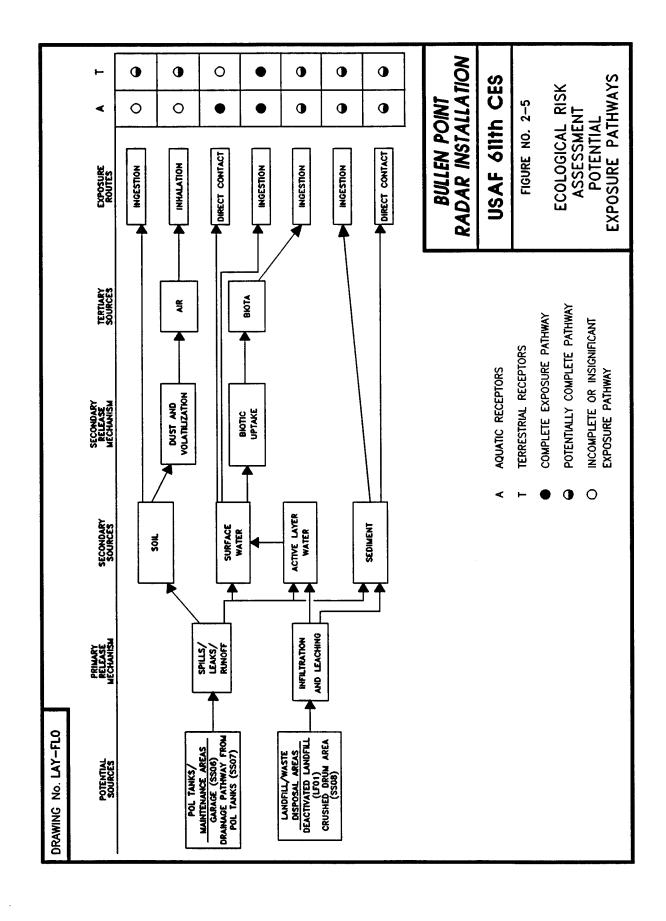
There are three main pathways through which contaminants may reach human and ecological receptors. These pathways are subsurface migration (in affected active layer water), surface migration, and air transportation (as vapors or dust). Potential migration pathways are depicted in Figure 2-3. Figures 2-4 and 2-5 present the potential exposure pathways for the human and ecological receptors, respectively. The discussion of migration pathways is preceded by a general description of the topography and stratigraphy at Point Lay.

2.4.4.1 Topography. The Point Lay installation is located on the west shore of Kasegaluk Lagoon, approximately 1.25 miles south of the Kokolik River. The installation is situated south of the village of Point Lay, which is located midway between most station facilities and the Kokolik River. Although the Point Lay installation encompasses 1,442 acres of terrain, most installation facilities are clustered adjacent to the module train in the western portion of the installation acreage.

The average elevation at the Point Lay installation is approximately eight feet AMSL. The surrounding topography is very flat, except near the shore of Kasegaluk Lagoon, where there is an approximately eight foot beach bluff. Drainage at the site consists of small, marshy streams and drainage ditches, with the streams becoming better defined and slightly incised near the







beach bluffs. The surrounding terrain is generally marshy. Gravel pads and roads rise approximately four to five feet above the tundra and account for most of the local topography at the site.

The most prominent topographic features, visible from the air and ground surface, are ice wedge polygons. These features are formed by cracking of the ground surface during thermal contraction, followed by the infiltration of water. The water then freezes and forces the crack wider. Repeated freeze-thaw cycles enlarge these features, which form small troughs and may fill with water. Intersecting troughs form polygonal arrangements, that range from a couple of feet to tens of feet across.

Two types of ice wedge polygons exist: low centered and high centered. In low centered polygons, the middle of the polygon is depressed to form a small basin, which may fill with water. A cross-section of one of these basins would reveal an ice-wedge trough on either side of the polygon, berms lining both sides of the troughs, and a basin filling the interior space between the berms. A high centered polygon does not have a depressed center, and consists of intersecting troughs with higher ground in the middle.

Another prominent tundra feature consists of oriented lakes. These lakes, which form from low centered polygons, are enlarged by the erosional action of wind-induced waves. These lakes are generally not circular but oblong, with the long axis of the lake normal to the prevailing wind direction. They can "migrate" across the tundra at an average rate of three feet per year (Livingstone 1954) and have a stable depth of approximately 10 feet (Hussey and Michaelson 1966).

2.4.4.2 Stratigraphy. The stratigraphy at Point Lay was examined during RI activities down to the level of the permafrost (generally no deeper than two to four feet during August and September 1993). The upper-most features at the site are gravel roads and pads of human origin. These features, which are limited in areal extent, have a maximum height of approximately six feet. They generally consist of well-graded sandy gravels with sub-angular to sub-rounded, very fine to coarse sands and sub-angular to sub-rounded gravel clasts ranging from one-quarter inch to one and one-half inches (although gravel clasts ranging up to four inches or more are occasionally encountered). The grains are unconsolidated, and fine material (silts or clays) may be present in minor quantities.

Gravel pads and roads were constructed on top of native tundra, which occurs throughout the site. The top of the tundra consists of a vegetative mat in a loamy/silty matrix. This mat can reach several inches in thickness. Underlying the tundra mat are fine to coarse sands and gravels, dark brown organic clays, and silt layers. The depth to permafrost beneath the tundra was approximately two feet during the 1993 RI.

2.4.4.3 Subsurface Migration. Active layer water flow under the tundra is hampered by the presence of numerous wet depressions and the relatively flat topography; because the depth to permafrost under these depressions is increased, they tend to act as small catchment basins. These basins limit the potential for the horizontal flow of active layer water (Miller et al. 1980; Robertson 1988). The active layer water flow in these areas is so inhibited that it can contribute

little to the midsummer water budget of tundra streams. Most of the active layer water contribution to these streams is from immediately adjacent well-drained slopes (Robertson 1988).

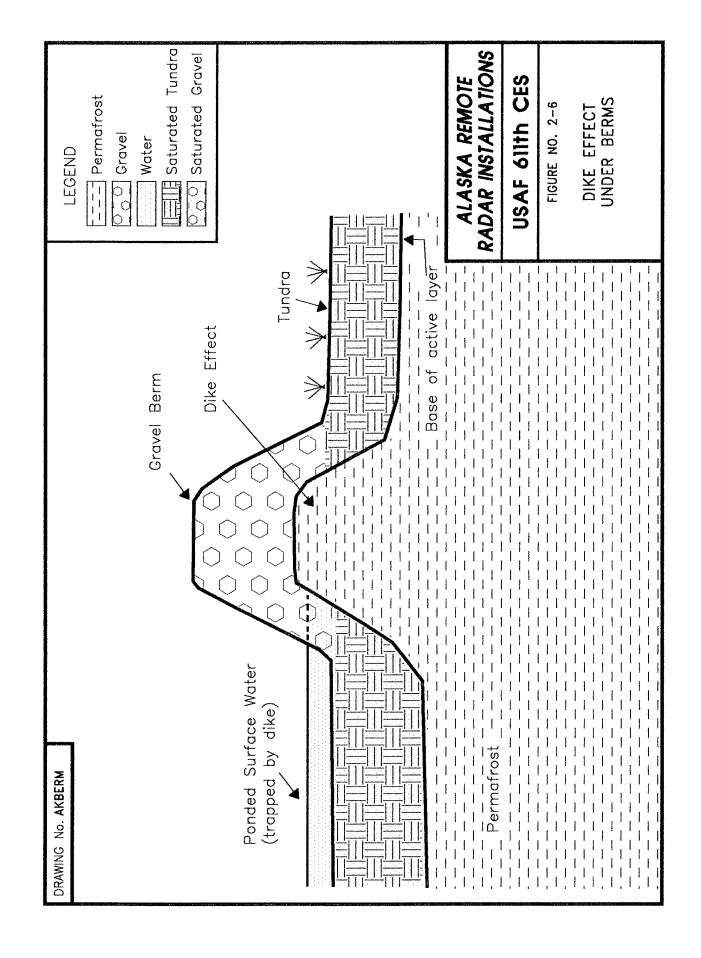
Some generalizations about active layer water flow can be made. Due to the combined effects of low topographic relief and the presence of numerous catchment basins, active layer water migration through areas of tundra is a slow process. The active layer water contribution to tundra streams is mainly from well-drained slopes next to those streams. The active layer water flow that does occur is governed by changes in topographic relief and is limited to spring and summer months, with the active layer functioning as a shallow, unconfined aquifer. The water table in such an aquifer tends to mimic topographic features, and active layer water flow is driven by elevation changes. Figure 2-6 illustrates how the elevation changes of gravel roads and berms can restrict active layer water flow.

2.4.4.4 Surface Migration. Surface migration at Point Lay may occur as a result of the flow of surface water from topographic highs to topographic lows. Surface water flow during the spring thaw, when mounds of snow can channel drainage in unexpected directions, can be markedly different from flow during the summer months. The general surface migration features and directions are depicted in Figure 1-8.

The main factors controlling surface water flow are the topography and water availability. The topography at the Point Lay installation has very little relief; therefore, there is only a small gradient to drive surface water flow. Combined with the depressions formed by the ice wedge polygons, this creates a multibasinal drainage pattern in which much of the surface water is directed into depressions and small tundra ponds, rather than draining directly into drainage channels. Gravel pads provide the greatest topographic relief at the installation. Surface migration is generally radial out from the gravel pads.

Based upon precipitation alone, Point Lay could classify as a desert (Robertson 1988). Precipitation along the Chukchi Sea coast averages only seven inches per year (Dingman et al. 1980; Walker et al. 1980). Additionally, 65 percent of the precipitation on the North Slope is in the form of snow (Walker et al. 1980). Most surface water flow occurs during the spring, when melting snow and ice release stored water over a relatively short time-frame and the active layer remains partially frozen. This creates a situation in which there is a large supply of surface water and very little capacity for infiltration. The result is the overland sheet flow (Robertson 1988), during which drainage is not confined to local drainage features but may travel in a sheet-like fashion over the topography. Snow, ice, and man-made features (gravel pads and roads) may also result in barriers that force the flow of surface water in directions different from those dictated by the underlying ground surface.

There is comparatively little flow of surface water during the summer. In fact, arctic wetlands exist because the lack of significant vertical relief retards the horizontal flow of surface water, and permafrost limits downward flow (Robertson 1988). Overflow from tundra ponds is generally dependent upon summer rainfall.



The potential for contaminant migration in surface water is, therefore, greatest during the spring thaw, which is of relatively short duration, during which the precise direction of flow may be difficult to determine.

No large streams cross the installation and enter Kasegaluk Lagoon. A few small, poorly defined streams and drainage ditches drain local areas of the installation. These features become better defined and slightly incised near the beach bluffs adjacent to Kasegaluk Lagoon.

2.4.4.5 Air Transport. Air transportation of contaminants is not considered to be a significant migration pathway at Point Lay. The frozen conditions encountered most of the year are not conducive to the volatilization of organic contaminants or to the transport of affected dust and dirt. During the summer months the air and ground temperatures remain relatively low (reducing volatility) and the abundant supply of moisture retards the entrainment of affected dust.

2.4.5 Receptors

Three potential human receptor groups were evaluated for the Point Lay Risk Assessment: an adult assigned to a DEW Line installation (worker), an adult native of the North Slope of Alaska (native), and a native child (child). These receptor groups represent the reasonable maximum exposure at an installation that is in close proximity to a native village and may be released for civilian use at some time in the future.

The primary routes of human exposure evaluated in the Point Lay Risk Assessment are incidental ingestion of soil/sediment and ingestion of surface water.

For the ecological evaluation it was assumed that terrestrial and aquatic species are potential receptors for at least the six months of the year when the region is not ice and snow covered. In addition, it was assumed that species that occur at great distances from the specific installations are not receptors (e.g., whales). Whales may migrate off-shore from the DEW Line installation; it is unlikely, however, that these mammals are potential receptors to COCs released from the sites because of dilution of surface water entering the Arctic Ocean and the distance off-shore that these animals migrate. Potential ecological receptors evaluated in the ERA were discussed in Section 2.4.2.

The potential human health and ecological risks to receptors associated with the contaminants detected at the Point Lay sites are reported on a site-specific basis in Section 3.0.

3.0 REMEDIAL INVESTIGATION - REMEDIAL ACTION SITES

This section of the RI/FS presents results from RI sampling and analysis activities for each of the four Point Lay sites where remedial action may be warranted. The four sites considered for remedial action and discussed in this section are the Deactivated Landfill (LF01), Garage (SS06), Drainage Pathway from POL Tanks (SS07), and Crushed Drum Area (SS08). Each of the sites is presented individually in Sections 3.1 through 3.4. (Note: figures and tables are presented at the end of each section.) The information presented for each site includes site background, field sampling and analytical results, potential migration pathways, human health and ecological risk assessment summaries, and conclusions and recommendations. The site-by-site discussions in this section are intended to provide the reader with all information needed to understand the site conditions and make decisions regarding appropriate action for each of the sites.

Photographs of the Point Lay installation and the sites investigated during the RI are presented in Appendix B. Data tables in this section list analytical results from samples in which chemicals were detected above quantitation limits. Complete laboratory analytical data sheets for each sample, including quantitation limits for non-detected analytes, are presented in Appendix F.

3.1 DEACTIVATED LANDFILL (LF01)

3.1.1 Site Background

The Deactivated Landfill (LF01) site is located southeast of the hangar. It was the installation landfill from 1973 to 1987. At the time of closure, the area was cleared of major surface debris, graded, covered with gravel, and seeded with grass. A small seasonal stream appears to be eroding the landfill cover, exposing rusty drums and landfill debris. Standing water along the landfill's western edge and surface runoff from the gravel pad area south of the hangar are possible source areas for the small stream. The water downstream from the landfill showed minor discoloration and biogenic sheen.

Previous sampling, conducted in 1987 by Air Force contractors, detected VOCs and SVOCs in surface water at the site. A detailed list of source areas, contaminants, and concentrations previously detected is presented in the RI/FS Work Plan (U.S. Air Force 1993a).

The site-specific environmental setting describing the topography, surface water drainage, and soil types is presented in the discussion of potential migration pathways, Section 3.1.3.

3.1.2 Field Sampling and Analytical Results

This section describes the RI sampling and analytical results for samples collected at the Deactivated Landfill (LF01) site. The discussion presents a review of laboratory data, data summary tables, contaminants identified, contaminant trends, and information on suspected source areas.

3.1.2.1 Summary of Samples Collected. A total of 22 samples was collected from tundra and the overgrown gravel cap at the site. These consisted of 13 sediment and 9 surface water samples. Table 2-2 presents a detailed summary of the samples collected and the analyses performed during the 1993 RI field activities. Locations of all samples collected at the Deactivated Landfill (LF01) site are presented in Figure 3-1.

Thirteen sediment samples were analyzed for DRPH and GRPH. In addition, ten sediment samples were analyzed for RRPH, BTEX, HVOCs, and PCBs. Four samples were analyzed for VOCs, and one sample was analyzed for SVOCs, pesticides, total metals, TOC, TSS, and TDS.

The nine surface water samples were analyzed for DRPH and GRPH. In addition, seven samples were analyzed for RRPH, BTEX, HVOCs, and PCBs. Three samples were analyzed for VOCs, and one sample was analyzed for SVOCs, pesticides, total and dissolved metals, TOC, TSS, and TDS.

3.1.2.2 Analytical Results. The data summary table (Table 3-1) presents analytical results for all samples collected at the site. Detection and quantitation limits, action levels, associated laboratory and field blanks, and background analytical results are presented for each of the analyses. Background levels are listed to allow direct comparison of naturally occurring organic compounds and inorganic analytes with samples collected from the site. Sample locations and analytical results for the samples at the site are illustrated in Figure 3-1. All organic compounds detected are presented on the figure except when they were a result of laboratory contamination or field decontamination procedures. Only metals detected above background levels that exceed an RBSL or ARAR are presented on Figure 3-1. The exceptions are presented on the data summary table.

The following section presents a discussion of organic compounds and inorganic analytes detected above background levels at the site. A discussion of TDS, TSS, and TOC is included.

Organics. Organic compounds detected in soil samples collected at the site include DRPH, GRPH, BTEX compounds, five other VOCs, and one SVOC. DRPH were detected in two sediment samples at 624 and 39.9 mg/kg (LF01-2SD13 and LF01-2SD14, respectively). GRPH were detected at low concentrations in two sediment samples at 1.73 and 11.9 mg/kg (LF01-2SD12 and LF01-2SD14, respectively). BTEX (total) was detected at very low levels in two samples at 0.408 and 0.724 mg/kg; xylenes were the primary component. Five other VOCs (tetrachloroethene, p-isopropyltoluene, naphthalene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene) and one SVOC (benzyl alcohol) were detected at very low concentrations (0.042 to 1.38 mg/kg) in three sediment samples.

In surface water samples, organic compounds detected at the site include DRPH, GRPH, BTEX, and 11 other VOCs. DRPH were detected in two samples at 181 and 240 μ g/L (LF01-2SW09 and LF01-2SW10, respectively). GRPH were detected in surface water sample LF01-2SW09 at 223 μ g/L. BTEX compounds were detected in three surface water samples at concentrations ranging from 1.1 to 23 μ g/L; benzene was the primary component. Eleven other VOCs were detected at concentrations ranging from 1.3 to 109 μ g/L. The primary components were dichlorodifluoromethane (58 μ g/L) and tetrachloroethene (109 μ g/L).

Inorganics. In sediments, metals analyses indicated that three metals (copper, iron, and zinc) were detected above background levels at the site. TOC were reported at 28,400 mg/kg in sediment sample LF01-SD04/SD08.

In surface water samples, four metals (barium, iron, manganese, and potassium) were detected above background concentrations. In surface water sample LF01-SW04/SW08, TOC, TSS, and TDS were reported at 20,400, 96,000, and 870,000 µg/L, respectively.

3.1.2.3 Summary of Site Contamination. Previous sampling conducted at the Deactivated Landfill (LF01) detected VOCs and SVOCs at low concentrations in the surface waters bordering the landfill. The results and sources of previous sampling efforts are presented in the RI/FS Work Plan (U.S. Air Force 1993a). The quality of the previous IRP sampling data is unknown as is the data validation, if any, that these data have undergone.

During previous sampling, conducted in 1987, nine VOCs and SVOCs were detected in two surface water samples. The VOCs and SVOCs were detected at concentrations ranging from 1.2 to 17 μ g/L; the primary components were methylene chloride (17 μ g/L), trichlorofluoromethane (9.3 μ g/L), and tetrachloroethene (6.4 μ g/L).

A comparison of historical and current project data indicates that there is a higher concentration of VOCs in surface water at the site than there has been in the past. VOCs were detected during the 1993 RI at concentrations up to 109 μ g/L (tetrachloroethene) and 58 μ g/L (dichlorodifluoromethane). Petroleum compounds (DRPH and GRPH) were detected during the current RI in soil (624 and 11.9 mg/kg, respectively) and in surface water (240 and 223 μ g/L, respectively). Differences between past and current data are likely to be a result of more extensive sampling during the 1993 RI.

The human health and ecological risks associated with the chemicals detected at the site are presented in Sections 3.1.4 and 3.1.5. The suspected source of contaminants detected during sampling conducted at the Deactivated Landfill site is buried garbage and debris from previous waste disposal practices. The landfill has been inactive since 1987.

Based on field data, source of contamination, and concentration of the contaminants, the contaminated soil and landfill debris area are limited to approximately 5,625 square feet located south of the hangar and adjacent to the lagoon.

3.1.3 Migration Pathways

This section describes the topography and stratigraphy of the site and the migration potential of contaminants from the site. A discussion of receptors and chemical concentrations at receptors is included.

3.1.3.1 Topography and Stratigraphy. The landfill area consists of a revegetated gravel cap, beach bluff, beach, and small intermittent streams. The topography throughout most of the site is relatively flat except near the lagoon, where the ground surface drops approximately eight feet down to a beach. Small streams have eroded gullies along the eastern edge and into the

southern edge of the site near the beach bluff. Landfill debris is present along exposed landfill faces, particularly in the gully eroding into the south portion of the site, where several crushed drums are visible.

The active layer at this site was approximately two feet thick in tundra areas and four feet thick under gravel pads and roads during the 1993 Rl. Gravel pad material consisted of the typical gravels and sands associated with these features, and subsurface tundra materials were of the typical stratigraphy found at Point Lay (Section 2.4.4.2).

3.1.3.2 Migration Potential.

Subsurface Migration. Three small streams are located at the site. Sluggish ephemeral streams are located on the western and eastern edges of the site. The western stream terminates at a small pond adjacent to the west edge of the gravel pad and is a potential source of water for the stream eroding into the southern portion of the site. Samples collected from the stream eroding into the southern portion of the landfill indicate that surface water and sediments have been contaminated with DRPH, GRPH, and VOCs. Upgradient samples from the eastern and western streams were uncontaminated, indicating that the contaminant source is in the landfill. For this reason, the potential for subsurface contaminant migration is considered high.

Surface Migration. Analytical data indicate that surface water and sediments in the southern stream have been contaminated with DRPH, GRPH, and VOCs. Because this stream discharges into the immediate vicinity of Kasegaluk Lagoon, the potential for offsite contaminant migration in surface water is considered to be high. Samples collected in the eastern and western streams indicate that these streams were not affected.

Air Transport. Air transportation is not considered to be a significant mode of migration at the site (Section 2.4.4.5).

Summary of Migration Potential. Analytical data indicate that surface water and sediments in the stream eroding into the southern portion of the site have been contaminated with DRPH, GRPH, and VOCs. The upgradient samples collected from the western stream, which is a potential water source for the southern stream, were not affected, indicating the contaminant source is the landfill. The potential for contaminant migration in surface and subsurface water is considered to be significant.

3.1.3.3 Receptors and Chemical Concentrations at Receptors.

Human Receptors. Potential human receptors at the Deactivated Landfill (LF01) site include Air Force contractor personnel working at the station, visitors to the station, and an occasional local visitor passing the site to get to recreational or subsistence lands. Human receptors could potentially be exposed to the chemicals detected in surface water and soil/sediments at the site. The primary routes of potential exposures at the site are direct contact with, and incidental ingestion of, soil/sediment and ingestion of surface water. Because ground water and air at the Point Lay sites are not considered complete pathways of exposure, these media are not evaluated as potential pathways to human receptors.

The Point Lay Risk Assessment (U.S. Air Force 1996) evaluates in detail the risks to human health from all COCs detected at the site. The potential receptor groups were selected based on their likelihood of exposure to contaminants at the site and include DEW Line workers at the installation, and native adults and children who may visit the site. The estimated exposure point concentrations for human receptors are based on the maximum concentration of each chemical detected at the site. The potential risks to human health associated with site chemicals at Point Lay are presented in Section 3.1.4.

Ecological Receptors. Ecological receptors were evaluated in detail in the Point Lay Risk Assessment (U.S. Air Force 1996) to determine if plants and animals could potentially be affected by the chemicals detected at the Point Lay installation. Because of the diversity of the plants and animals in the area of the Point Lay installation, a set of representative species was selected in the ERA for detailed evaluation. The species include plants, aquatic invertebrates, fish, birds, and mammals. These receptors were selected based on the likelihood of exposure given their preferred habitat and feeding habits. The representative species encompass a range of ecological niches in order to achieve the best characterization of the ecosystems being examined and are presented in Table 2-6.

The estimate of chemical concentrations at the ecological receptors was based on the average site-wide concentration of each COC. This approach was appropriate because few of the representative species would inhabit only one distinct site at the installation; they are more likely to be exposed to the mix of chemicals and concentrations detected on all the sites at Point Lay. The potential ecological risks associated with the chemicals at detected at the site are presented in Section 3.1.5.

3.1.4 Human Health Risk Assessment

This section presents a summary of the potential human health risks associated with the chemicals detected at the Deactivated Landfill (LF01) site. The purpose of the human health risk assessment is to quantify the excess lifetime cancer risk and/or the noncancer hazard (reported as hazard index) from the chemicals detected at the site.

This summary presents the COCs at the site, the pathways by which human receptors may be exposed to site chemicals, potential risks to human health posed by each chemical through each exposure pathway, the significance of the risk and/or hazard estimate, and a comparison of site chemical concentrations to ARARs. The methods and assumptions used in calculating hazards and risks are presented in Section 2.4.1.

3.1.4.1 Chemicals of Concern. At the Deactivated Landfill (LF01), the only COC identified in soil/sediment at the site was DRPH. The concentration of DRPH exceeded the background concentration and the ARAR concentration for petroleum hydrocarbon contamination of soil (ADEC 1991).

GRPH, benzene, tetrachloroethene, trichloroethene, dichlorodifluoromethane, and manganese were identified as COCs for surface water at the site. GRPH exceeded the RBSL based on cancer risk. Benzene exceeded the RBSL based on cancer risk and the ARAR concentration for

benzene contamination of soil (ADEC 1991). Dichlorodifluoromethane and manganese exceeded their RBSLs based on noncancer hazard. Trichloroethene exceeded the RBSL based on cancer risk. Tetrachloroethene exceeded the RBSLs based on noncancer hazard and cancer risk and the surface water ARAR, which is a maximum contaminant level (MCL) promulgated under the federal Safe Drinking Water Act.

Table 3-2, Identification of COCs at the Deactivated Landfill, presents the maximum concentrations of chemicals detected at the site, the associated background concentrations, RBSLs, and ARARs, and identifies COCs selected in the risk evaluation.

3.1.4.2 Exposure Pathways and Potential Receptors. Because COCs were identified for soil/sediment and surface water at the site, the potential risks associated with ingestion of soil/sediment and surface water were evaluated in the risk assessment.

Three potential receptor groups were evaluated in the risk assessment: an adult assigned to a DEW Line installation (worker), an adult inhabitant of communities in the North Slope of Alaska (native), and a child living in a North Slope community (child).

3.1.4.3 Risk Characterization.

Noncancer Hazard and Cancer Risk Associated with Soils and Sediments. The noncancer hazard associated with the ingestion of soil by a hypothetical native northern adult/child is 0.009, and by a DEW Line worker is <0.001, based on the maximum concentrations of the COCs. The presence of DRPH accounts entirely for the quantifiable noncancer hazard for these receptor/pathway combinations.

No carcinogenic COCs were identified for the soil/sediment at the site; therefore, the excess lifetime cancer risk associated with ingestion of soil/sediment cannot be quantified.

Noncancer Hazard and Cancer Risk Associated with Surface Water. The noncancer hazard associated with the ingestion of surface water at the Deactivated Landfill by a hypothetical native northern adult or by a DEW Line worker is 2.9 based on the maximum concentrations of the COCs. Manganese, GRPH, tetrachloroethene, trichloroethene, and dichlorodifluoromethane account for the quantifiable noncancer hazard for these receptor/pathway combinations. Manganese alone accounts for more than 90 percent of this noncancer hazard.

The excess lifetime cancer risk associated with the ingestion of surface water at the site by a native northern adult is 7×10^{-5} , and by a DEW Line worker is 1×10^{-5} , based on the maximum concentrations of the COCs. The presence of GRPH, benzene, and tetrachloroethene accounts entirely for the quantifiable excess lifetime cancer risk for these receptor/pathway combinations. Tetrachloroethene alone accounts for 90 percent or more of the cancer risk.

3.1.4.4 Summary of Human Health Risk Assessment. The potential risks and hazards associated with the soil/sediment at the Deactivated Landfill site are limited to the low noncancer hazards (hazard indices of 0.009 and <0.001) associated with DRPH. These noncancer hazards

are below one and were calculated conservatively based on a residential scenario. Therefore, the noncancer risks associated with soil/sediment at the site are minimal.

A hazard index of 2.9 is associated with the COCs, primarily manganese, in surface water at the site indicating a minimal noncancer risk. The cancer risk for the native adult is 7 x 10⁻⁵, and for a DEW Line worker is 1 x 10⁻⁵; neither exceed the 1 x 10⁻⁴ threshold level at which remediation is usually recommended (EPA 1991b). The potential hazards and risks were calculated assuming the affected surface water would be used as a sole-source water supply for 180 days per year. Based on site-specific information, the chemicals in surface water do not currently pose a health hazard nor are they likely to pose a hazard in the future. The surface water expressions at the site are frozen most of the year; many are only intermittently filled with water during the summer months. The surface water at the site is not known to be used as a water supply now, nor has it been used in the past. In conclusion, under current uses the COCs identified in surface water at the Deactivated Landfill site pose only a minimal, if any, potential threat to human health. In the unlikely event that surface water at the site is used as a sole-source drinking water supply in the future, a potential noncancer hazard to human health could exist if conditions remain constant.

In conclusion, under current uses the COCs identified soil/sediment and surface water at the Deactivated Landfill pose only minimal, if any, potential threat to human health. Based on the human health risk assessment, remedial actions are not warranted at the site.

3.1.5 Ecological Risk Assessment

The objective of the ERA is to estimate the potential impacts of chemicals detected at the installation on aquatic and terrestrial plants and animals. A summary of the methods used to assess potential ecological impacts is presented in Section 2.4.2.

- 3.1.5.1 Chemicals of Concern. COCs for the ERA were selected based on criteria presented in Section 3.1 of the ERA. The average installation-wide concentration of COCs were used to calculate the risk estimates. All sites at the installation were considered to be potentially usable habitat. The COC selection process only considered the soil/sediment samples that were at or less than 1.5 feet deep. The soil/sediment samples were screened for depth because it is unlikely that any of the representative species will be exposed to soil/sediments deeper than 1.5 feet. Iron, manganese, and DRPH were identified as COCs in surface water at the Deactivated Landfill, and the COCs in soils/sediments were DRPH, GRPH, toluene, ethylbenzene, xylenes, tetrachloroethene, benzyl alcohol, lead, and zinc. None of the identified COCs was associated with significant risk estimates at the Deactivated Landfill site.
- **3.1.5.2** Summary of Ecological Risk Assessment. Based on the quantification of potential risks to ecological receptors and discussions presented in the Point Lay ERA, ecological risks at the Deactivated Landfill are minimal.

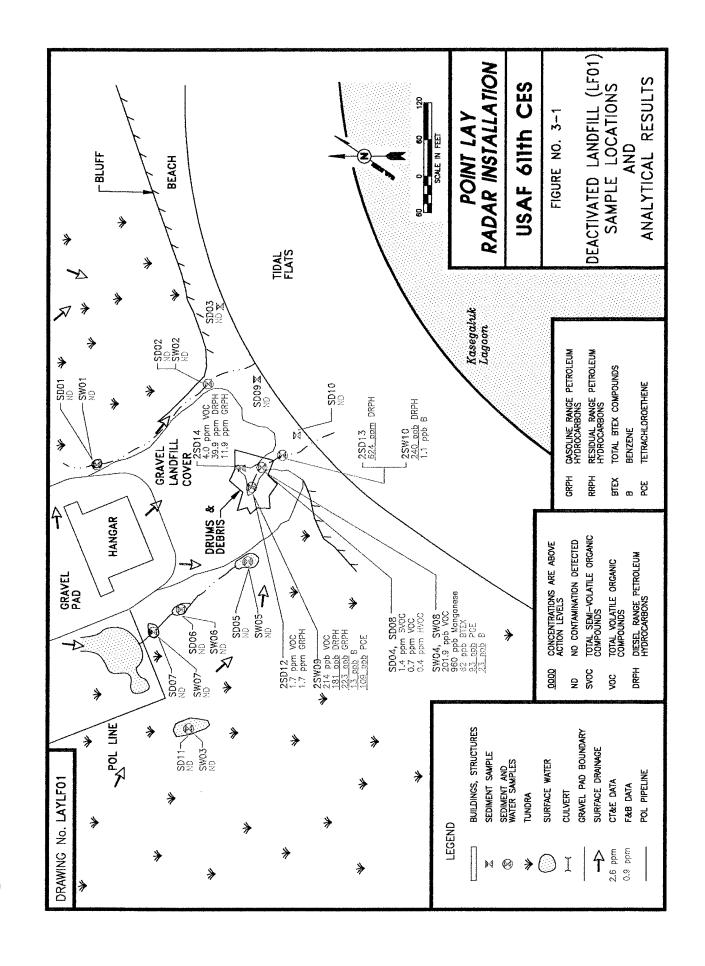
3.1.6 Conclusions and Recommendations

Sampling and analyses have determined that the Deactivated Landfill (LF01) site is contaminated with petroleum compounds and VOCs. The contaminated media at the site include surface water, soil/sediment, and landfill debris south of the hangar. The source of contamination is suspected to be buried garbage and debris from previous waste disposal practices. The landfill has been inactive since 1987.

Migration of contaminants from the site appears to have been occurring. Affected media is estimated to be approximately 5,625 square feet of landfill material and associated soil cover. Surface water drainage is eroding into the landfill materials, and analytical data suggest that migration of contaminants is occurring.

The risk assessment concluded that risks posed to human health or ecological receptors by site contaminants are minimal given current or future site uses. A low potential noncancer hazard was identified in the human health risk assessment from COCs in surface water, primarily manganese; however, the risks and hazards are based on a conservative future scenario and are not of a magnitude that normally requires remedial action. The ERA concluded that the overall potential risks posed by site contaminants are minimal. Therefore, considering the findings of the risk assessment, remediation of the site is not necessarily warranted.

Levels of DRPH, GRPH, and VOCs detected in site surface water do exceed ADEC guidance cleanup levels, and migration of contaminants has occurred. Therefore, the site is being recommended for remedial action. The source area at the site consists of approximately 5,625 square feet (625 cubic yards) of landfill debris and soil. The remedial action alternative recommended for the site is offsite incineration. A complete description and evaluation of the remedial alternatives considered for this site are presented in the FS, Section 4.0.



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TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY

Parish P	Installation: Point Lay Site: Deactivated Lan	Installation: Point Lay Site: Deactivated Landfill (LF01)	Matrix: Units:	Sediment mg/kg													
Diminist Clarinary Anthonists Clarinary								ū	nvironmental Sar	npies				Field Blanks		-	+
The column The	Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	SD01	SD02	SD03	SD04 (Repli	& SD08 cates)	SD05	90OS	AB01	EB02	TB02	3 86	ab ınks
10-40 10-50 10-2	Laboratory Sample ID Numbers					478	480	482	484 4354-6	492 4356-13	486	488	4356-5	557/572 4356-2	569 4356-1	#5-82793 #3&4-82593 4356	#5-82593 #182-82593 4354 4356
5-19 56-190 500 ¹ 6-20 ¹ -c-100 c-20 ¹ -c-40 ¹ c-20 ¹ c-40 ¹ c-10 ² c-40	ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/L	J/6ri	7/6#	7/6n	mg/kg
10-40 100-400 2,000° 4,000 4	DRPH	5-19	50-190	500g	450 ² < 100 ⁵	< 150 ⁰	<190 ⁰	<50،	<60 ⁵	<100 ²	<.609 ²	gg v	¥	< 1,000 ⁰	NA A	<1,000	<50
10-40 100-400 2,000° 2,000° 2,000° 2,000° 2,100° 2	GRPH	0.1-3.2	1-32	92	<3.1 ⁰ .<4.1 ⁰	grac>	<4.0	dL1.>	dr1>	-23J	⊕1.>	^d LS>	NA	× 100.1 ⁸	<100.P	<100J	C1.>
0.002-0 0.02-0	RAPH (Approx.)	10-40	100-400	2,000 ³	<100	>300	00°>	× 100	V 120	<200	o 120	500 ×	¥.	<2,000	NA	<2,000	<100
0.002- 0.0004 0.02-0.00 <0.02-0.07 0.02-0.07 0.02-0.07 0.02-0.07 0.02-0.07 0.02-0.07 0.02-0.07 0.02-0.07 0.02-0.09	BTEX (8020/ 8020 Mod.)			10 Total BTEX	<0.13-<0.20	<317	<0.61	0) O>	<0.15	OZ D>	×0.15	62.0°					
0.002- 0.0066 0.02-0.8 0.02-0.8 0.02-0.8 0.000-0.006 0.000-0.006 0.000-0.006 0.000-0.006 0.000-0.12 0.0000-0.12 0.0000-0.12 0.0000-0.12 0.0	Benzene	0.002-	0.02-0.07	0.5	<0.02~<0.04	<0.07	×0.07	20 00×	<0.03	*00 *	<0.03	e0.04	<1 ^c	Ÿ	V	⊽	<0.02
0.002-0.12 0.02-1.2 c004-0.13 c004-0.13 <t< td=""><td>Toluene</td><td>0.002-</td><td>0.02-0.6</td><td></td><td>*0.02 <0.04</td><td>90></td><td><0.0×</td><td><0.02</td><td><0.03 <0.03</td><td>×0.04</td><td>£0.0></td><td>70'02</td><td><1_C</td><td>ţ</td><td>⊽</td><td>⊽</td><td><0.02</td></t<>	Toluene	0.002-	0.02-0.6		*0.02 <0.04	90>	<0.0×	<0.02	<0.03 <0.03	×0.04	£0.0>	7 0'02	<1 _C	ţ	⊽	⊽	<0.02
0.004-0.13 0.04-1.3 COM-COM COM COM COM COM COM COM COM COM COM	Ethyl- benzene	0.002-0.12	0.02-1.2		<0.03×0.04	e V	70 QV	20 t y	130 2	70.0×	<0.03	7 002	<1 _c	V	Ţ	⊽	<0.02
0.002- 0.007- 0.007- 0.008-0.056 0.008-0.0	Xylenes (Total)	0.004-0.13	0.04-1.3		SD:D4-KD:D8	a A	ą g	8 00 20	<0.08	40.08	90'0>	*0.08	\2°	Ÿ	\$	<2 2	<0.04
0.002- 0.007- 0.	HVOC 8010																
60 0.025-0.050 c.025-0.050 c.030-<0.150 NA NA 0.306J 0.622 NA NA <1 <1 <1	Tetrachloro- ethene	0.002-	0.02-0.07		<0.043-<0.043	<0.07J	r20 0>	720:D>	PED Q>	170	CE0.02	<0.04.1	¥.	۲	V	⊽	<0.02J
loro- 0.0250 0.025-0.050 <0.0300-0.150 NA NA NA 0.306J 0.622 NA NA <1 <1 <1	VOC 8260																1
	Tetrachloro- ethene	0.020	0.025-0.050		<0.030-<0.150	NA	N	N A	0.306J	0.622	A N	A N		7	7	٢	<0.020

CT&E Data. F&B Data.

Not analyzed.

Result is an estimate.
Result has been rejected.
The action levels for DRPH and RRPH are based on conversations with ADEC; final action levels have not yet been determined.
The action levels for DRPH and RRPH are based on conversations with ADEC; final action levels have not yet been determined.
DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.
BTEX determined by 8260 method analysis.

TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Site: Deactivated Lan	Installation: Point Lay Site: Deactivated Landfill (LF01)		Matrix: Sediment Units: mg/kg													
							Ш	Environmental Samples	bles				Field Blanks			
Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	SD01	SD02	SD03	SD04 & SD08 (Replicates)	SD08 ates)	SD05	90CS	AB01	E802	TB02	Lab Blanks	d ks
Laboratory Sample ID Numbers					478	480	482	484 4354-8	492 4356-13	488	488	4356-5	557/572 4358-2	569 4356-1	#5-82793 4356	#5-82593 4354 4358
ANALYSES	mg/kg	mg/kg	mg/kg	шд/кд	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	μg/L	μg/L	J/Brl	µg/L	mg/kg
1,2,4- Trimethyl- benzene	0.020	0.025-0.050		<0.030-<0.150	NA A	NA	A A	0.055J	0.057	NA A	NA	⊽	⊽	7	₹	< 0.020
SVOC 8270																
Benzyl alcohol	0.200	0.400		<8.9-<15.0	NA	NA	NA	1.38	NA A	Ϋ́	¥ Z	¥ Z	<25	A A	<10	<1.00
Pesticides	0.002-0.05	0.02-0.5		rso>-repa>	ΨN	NA	NA	<0.02-<0.5	<0.02-<0.8	Ν	Ν	ΑN	<0.25<10J	V V	NA	<0.2J-<0.5J
PCBs	0.01-0.04	0.1-0.4	10	10>	<0.3	<0.4	<01	<0.1	402	40.1	802	NA A	ď	A N	<2.1	<0.1
700				57,000-69,300	NA	NA	NA	15,800	28,400	NA	¥	AN	NA	A A	NA	NA

CT&E Data. F&B Data. Not analyzed. Result is an estimate.

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TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

Laboratory Laboratory Laboratory Samples Analyzes	AVITABLES	Installation: Point Lay Site: Deactivated Lan	ation: Point Lay Deactivated Landfill (LF01)		Matrix: Sediment Units: mg/kg	lent									
Parameters Defect. Quanti. Action BK9C. SD07 SD09 SD10 SD11 ABD1 EBD2 TBD2 TBD2 TBD2 SD10 SD10 SD10 SD11 SD11 SD11 SD11 SD12 SD12 SD12 SD22	L				:	i	נה	nvironmental	Samples			Field Blanks		ב ב	g -
Laboratory Sample ID Propertion Properties Propertion Properties Propertion Propertion Propertion Properties Propertion Properties Propertion Properties Propertion Properties		Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	SD07	SD09	SD10	SD11	AB01	EB02	TB02	Dia	nks
ANALYSES mg/kg c60² c70² c70² c70² c70² c70² c60² c70² <	l	Laboratory Sample ID Numbers					490	494	496	498	4356-5	557/572 4356-2	569 4356-1	#5-82793 #3&4-82593 4356	#5-82593 #1 & 2-82593
DRPH 6.40 6.040 5.00° < 6.60° < 1.00° < 6.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00° < 1.00°<	<u> </u>	ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	μg/L	μg/L	μg/L	μg/L	mg/kg
GRPH 11-0.8 </td <td><u></u></td> <td>рврн</td> <td>6-40</td> <td>60-400</td> <td>500^a</td> <td>_q001>-_q06></td> <td><60°</td> <td><100₄</td> <td><60₽</td> <td><400⁵</td> <td>NA</td> <td><1,000^b</td> <td>A A</td> <td><1,000</td> <td><50</td>	<u></u>	рврн	6-40	60-400	500 ^a	_q 001>- _q 06>	<60°	<100 ₄	<60₽	<400 ⁵	NA	<1,000 ^b	A A	<1,000	<50
RPPH (Approx.) 12-80 120-800 c+100	<u> </u>	GRPH	0.1-0.8	1-8	100	ط44>-ط35>	^{ال} دا>	45.5°	41.>	<8J ⁵	NA	<100. ²	< 100. ^b	<50	<1J
BTEX (8020) TO (10 In	<u> </u>	RRPH (Approx.)	12-80	120-800	2,000ª	<100	<120	<200	<120	×800	¥ Z	<2,000	NA A	<2,000	<100
Benzene 0.003-0.02 0.03-0.2 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 <		BTEX (8020/ 8020 Mod.)			10 Total BTEX	<0.13-<0.20	<0.15	<0.25	<0.15	4.0					
Toluene 0.003-0.02 0.03-0.2 c.0.03 c.0.03 c.0.05	<u> </u>	Benzene	0.003-0.02	0.03-0.2	0.5	<0.02-<0.04	<0.03	<0.05	<0.03	<0.2	<16	7	٧		<0.02
0.003-0.02 0.003-0.02 0.003-0.02 0.003-0.02 0.005-0.04 0.005-0.05 0.005-0		Toluene	0.003-0.02	0.03-0.2		<0.02-<0.04	<0.03	<0.05	<0.03	<0.2 V0.2	<1c	٧	⊽		<0.02
0.006-0.04 0.06-0.4 0.06-0.4 0.06-0.4 0.06-0.4 0.006-0.04	<u></u>	Ethyl- benzene	0.003-0.02	0.03-0.2		<0.03-<0.04	<0.03	<0.05	<0.03	Z;0>	<1°	7	7	⊽	<0.02
8010 0.003-0.02 0.03-0.2 0.03-0.24 60.03-0.02 60.03		Xylenes (Total)	0.006-0.04	0.06-0.4		<0.04-<0.08	<0.08	-0>	<0.06	<0.4	<2°	<2	<2	<2	<0.04
0.01-0.08 0.1-0.8 10 <0.1 <0.1 <0.2 <0.1 <0.8 NA <2 NA <2.1		HVOC 8010	0.003-0.02	0.03-0.2		<0.03<0.04	<0.03J	<0.05J	<0.033	70.27 V0.27	NA	٧	⊽	~	<0.02J
		PCBs	0.01-0.08	0.1-0.8	10	<0.1	<0.1	<0.2	<0.1	<0.8	AN	8	Ϋ́	<2J	<0.1

CT&E Data.

F&B Data. Not analyzed.

Result is an estimate.

The action levels for DRPH and RRPH are based on conversations with ADEC; final action levels have not yet been determined. DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC. BTEX determined by 8260 method analysis.

TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

<u> </u>	Installation: Point Lay Site: Deactivated Landfill (LF01)	(LF01)	Matrix: Sediment Units: mg/kg	nent									
-				1		Envi	Environmental Samples	oles		Field Blanks		Lab	
	Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	2SD12	2SD13	2SD14	AB01	2EB03	2TB03	Blank	(S
<u> </u>	Laboratory Sample ID Numbers					4692-11	4692-12	4692-15	4356-5	4692-17	4692-16	4356 4692	4692 4356
	ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	μg/L	μg/L	μg/L	μg/L	mg/kg
	рярн	4.00	4.00	500ª	<50°+<100°	<4.00	624 ^c	39.9 ^d	N.	NA	NA	Ą	<4.00
	GRРH	0.400	0.400	100	ط44>°	1.73	<2.75	11.9	NA	NA	AN	AN	<0.400
<u> </u>	VOC 8260												
-	Ethylbenzene	0.020	0.020-0.240		<0.03-<0.150	0.054	<0.130	<0.240	∵	⊽	₹		<0.020
<u> </u>	p-Isopropyltoluene	0.020	0.020-0.240		<0.03-<0.150	0.067	<0.130	<0.240		⊽	⊽	^	<0.020
	Naphthalene	0.020	0.020-0.240		<0.03-<0.150	0.129	<0.130	0.409	· ·	۲۷	~	<u>^</u>	<0.020
3-	Tetrachloroethene	0.020	0.020-0.240		<0.03-<0.150	0.727	<0.130	1.92	^	₹	⊽	^	<0.020
	Toluene	0.020	0.020-0.240		<0.03-<0.150	0.042	<0.130	<0.240	<	۲-			<0.020
-	1,2,4-Trimethylbenzene	0.020	0.020-0.240		<0.03-<0.150	0.213	<0.130	0.552	.				<0.020
	1,3,5-Trimethylbenzene	0.020	0.020-0.240		<0.03-<0.150	0.128	<0.130	0.342		V			<0.020
	Xylenes (Total)	0.040	0.040-0.480		<0.06-<0.300	0.312	<0.260	0.724	<2	<2	<2	<2	<0.040

CT&E Data. F&B Data.

Not analyzed.

The action level for DRPH is based on conversations with ADEC, a final action level has not yet been determined.

DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC. The laboratory reported that the EPH pattern in this sample was not consistent with an unweathered middle distillate fuel.

The laboratory reported that the EPH pattern in this sample was not consistent with a middle distillate fuel. Result is an estimate.

TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

V.TADI E	Installation: Point Lay Site: Deactivated Landfill (LF01)	y ndfill (LF01)	Matrix: Units:	: Sediment mg/kg	u t	METAL	METALS ANALYSES						
M 4400=	Doromotore	Detect	C	Action	Bkgd. Range		Env	Environmental Samples	səldı		Field Blank		Lab Blanks
	9000	Limits	Limits	Levels	DEW Line Installations	SD04	SD08				EB02		
7104	Laboratory Sample ID Numbers					4354-6	4356-13				4356-2		4354 4356
	ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg				μg/L		μg/L
	Aluminum	0.35	2		1,500-25,000	2,400	2,200				<100		≥100
	Antimony	N/A	56-82		<7.8-<230	<82J	<56				<100		<100
	Arsenic	0.11	56-82		<4.9-8.5	<82	<56				<100		<100
	Barium	0.024	1		27-390	260	190				<50		<50
	Beryllium	N/A	28-41		<2.6-6.4	<41	<28				<50		<50
2	Cadmium	0.33	28-41		<3.0-<36	<41	<28				<50		<50
-15	Calcium	69.0	4		360-59,000	6,300	2,600				410	_	<200
	Chromium	990'0	•		<4.3-47	13	5.1				<50		<50
	Cobalt	N/A	5.6-8.2		<5.1-12	<8.2	<5.6				<100		<100
	Copper	0.045	1		<2.7-45	55	16				<50		<50
	Iron	0.50	2		5,400-35,000	70,000	19,000				<100		<100
	Lead	0.13	2-5.6		<5.1-22	18	<5.6				<100		<100
	Magnesium	96.0	4		360-7,400	1,900	1,500				<200		<200
	Manganese	0.025	1		25-290	2207	180				<50		<50
	Molybdenum	N/A	2.8-41		<2.5-<11	<41	<2.8				<50		<50
	Nickel	0.11	1		4.2-46	13	13				<50		<50
<u>Ω4</u>	Potassium	23	100-410		<300-2,200	<410	280				<5,000		<5,000

CT&E Data. Not available. Result is an estimate.

TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Site: Deactivated Landfill (LF01)	, ıdfill (LF01)		Matrix: Sediment Units: mg/kg	ŧ	METALS	METALS ANALYSES				
3500	Potoc	ţa	acito 4	Bkgd. Range		Enviro	Environmental Samples	Si	 Field Blank	Lab Blanks
ממוופופוס	Limits	Limits	Levels	DEW Line Installations	SD04	SD08			EB02	
Laboratory Sample ID Numbers					4354-6	4356-13			4356-2	4354 4356
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg			μg/L	μg/L
Selenium	1.2	28-95		<7.8-<170	< 82	<56			<100	<100
Silver	0.53	2.8-41		<3-<110	<41B	<2.8			<50	<50
Sodium	0.55	ß		<160-680	120	75			370	<250
Thallium	0.011	0.29-0.42		<0.2-<1.2	<0.42	<0.29			< ₂	<5
Vanadium	0.036	-		63-29	11	11			<50	<50
Zinc	0.16	-		9.2-95	380	125			<50	<50

CT&E Data. Result has been rejected.

□∝

TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Site: Deactivated Landfill (LF01)		Matrix: Surface Water Units: µg/L	e Water											
			;	i			Environmental Samples	al Samples				Field Blanks		Lab
Parameters	Detect. Limits	Cluant. Limits	Action Levels	bkga. Levels	SW01	SW02	SW03	SW04 & SW08 (Duplicates)	SW08 Ites)	SW05	AB01	EB02	TB02	blanks
Laboratory Sample ID Numbers					559/592	560/597	561/598	562/601 4358-1 4358-10	566/613 4358-11 4358-4	583/604	4356-5	557/572 4356-2	569 4356-1	#5-82793 #3&4-82593 4356 4358
ANALYSES	7/Bri	µ9∕L	µg/L	η/β#	ηβη.	μg/L	ηβη.	⊓/Bri	J/Bri	hg∕L	µg/L	µg/L	µg/L	µg/L
ОЯРН	100	1,000		<1,000 ⁸	<1,000 ⁰	<1,000 ^b	4000°1>	² 000,1>	4,000,1>	<1,000 ^b	NA	<1,000 ⁸	NA	<1,000
GRРH	10	100		<50. ^{tt}	<100J ⁰	⁴ L00.1≥	⁶ r001>	<1000 ³	4001>	<100J ^b	NA	<100. ⁰	< topl ^a	< 100J
RRPH (Approx.)	200	2,000		25,000	<2,000	<2,000	<2,000	<2,000	<2,000	<2,000	NA	<2,000	NA	<2,000
BTEX (8020/8020 Mod.)			į											
Benzene	0.1	-	5	1>	-5	44		ĸ	8	٧	<1 ^C	Ÿ	Ţ	<1
Toluene	0.1	-	1,000	44	- 41	4.4	41	đ	7	41	<1 ^c	Υ.	ř	<u>.</u>
Ethylbenzene	0.1	1	700	<1	- <1	44	15	tâJ	taj	ÿ	<10	ī	Ÿ	
Xylenes (Total)	0.2	2	10,000	€\$	4.2	2>	S. S.	207	ræ	ę,	<2°	e.	S. V	<2 <2
HVOC 8010														
Tetrachloroethene	0.1	-	5	7	1>	41	ţ,	8	8	13	¥.	Ÿ	Ţ	<1
VOC 8260														
Benzene	1	1	5	·	AA	Ϋ́	Y.	18	18	NA AN	۲>	٧	7	<1

TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

Installat Site: D	Installation: Point Lay Site: Deactivated Landfill (LF01)	III (LF01)	Matrix: Surface Water Units: µg/L	• Water											
								Environmental Samples	al Samples				Field Blanks		Lab
ď.	Parameters	Detect. Limits	Quant. Limits	Action	Bkgd. Levels	SW01	SW02	SW03	SW04 & SW08 (Duplicates)	SW08 ites)	SW05	AB01	EB02	TB02	Blanks
D CI	Laboratory Sample ID Numbers					559/592	260/297	561/598	562/601 4358-1 4356-10	566/613 4356-11 4358-4	563/604	4356-5	557/572 4356-2	569 4356-1	#5-82793 4356 4358
¥	ANALYSES	η/Bri	µg/L	µg/L	µg/L	J/Brl	J/6#	μg/L	μg/L	J/6n	μg/L	1/B#	J/Brl	1/6rl	µg/l.
Dichlorod methane	Dichlorodifluoro- methane	Ļ	-		₹	NA A	AN A	NA	33	34	¥.	7		₹	2
cis-1,2- Dichlord	cis-1,2- Dichloroethene	-	1	02	1>	NA	NA	NA	6.5	6.9	A N	⊽	⊽	⊽	
Ethylbenzene	ınzene	-	-	002	<1	NA	AN	NA	4.0	4.1	Y.	٧	~	۲	₹
p-Isopr	p-Isopropyltoluene	F	1		<1	NA	NA	NA	1.7	1.7	N.	<u>۲</u>	⊽	2	₹
Naphthalene	alene	-	_		1>	NA	NA	NA	<1,	3.4J	NA	۲۷	7	~	₽
<u> </u>	Tetrachloroethene	1	-	2	<1	NA	NA	Ϋ́	84	82	NA	٧	2	<u>۲</u>	<u>^</u>
Tolnene	60	1	1	1,000	<1	NA	NA	NA	7.3	7.2	V.	٧	⊽	₽	~
<u> </u>	Trichloroethene	-		5	-	NA	NA	ΝA	3.3	3.3	¥	^	⊽	۲	₽
Trichlor	Trichloro- fluoromethane	-	-		1>	NA	ΝΑ	NA	9.0	2.9	N A	, v	⊽	⊽	₹
1,2,4- Trimeth	1,2,4- Trimethylbenzene	1	-		· >	NA	AN.	NA	۲	10	¥ Z	₹	₹	⊽	₹
1,3,5- Trimeth	1,3,5- Trimethylbenzene	1	-		^	NA	NA	NA	^	6.7	Y.	₽	٧	<u>^</u>	⊽
Xylene	Xylenes (Total)	2	2	10,000	<2	N A	NA	NA	21.7	21.7	Ą	<2>	2×	42	<2
SVOC 8270	8270	10	11-17		<20-<31	N A	NA	NA	<17	<11	Ϋ́	ΑN	<25	AN	<10
Pesticides	des	0.02-1	0.2-10		<0.2J-<50J	NA	NA	NA	<0.25<10J	FDI >-720>	NA	NA	<0.23-<10.1	ΝΑ	NA
PCBs		0.2	2	0.5	2>	g >	Å	25	22	å	a V	ΑN	8	AN	<2.1
10C		5,000	5,000		31,700-40,000	NA	NA	NA	17,800	20,400	NA	ΑN	Ν	NA	<5,000
04															

CT&E Data. F&B Data. Not analyzed. Result is an estimate.

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TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Site: Deactivated Landfill (LF01)	fill (LF01)	Matrix: Surface Water Units: μg/L	e Water											
							Environment	Environmental Samples				Field Blanks		Lab
Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	SW01	SW02	EOMS	SW04 & SW08 (Duplicates)	SW08 ates)	SWOS	AB01	EB02	TB02	Blanks
Laboratory Sample ID Numbers					559/592	560/597	561/598	562/601 4358-1 4356-10	566/613 4356-11 4358-4	563/604	4356-5	557/572 4356-2	569 4356-1	4356 4358
ANALYSES	µg/L	µg/L	J/6n	J/6#	μg/L	μg/L	7/6 ri	J/6rl	μg/l.	μg/L	J/6rt	J/Brl	лВ/L	J/6rl
TSS	100	200		6,000-77,000	NA	NA	NA	000'96	84,000	NA	Ā	A	AN	<200
TDS	10,000	10,000		149,000-151,000	NA	NA	NA	808,000	870,000	NA.	NA A	Ą	N	< 10,000

CT&E Data. Not analyzed. Result is an estimate.

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TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

AVITARI E	Installation: Point Lay Site: Deactivated Landfill (LF01)	(LF01)	Matrix: ξ Units: μξ	Matrix: Surface Water Units: µg/L								
<u> </u>							Environme	Environmental Samples		Field Blanks		Lab
000100	Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	SW06	SW07		AB01	EB02	TB02	Blanks
1.1781 2.4	Laboratory Sample ID Numbers					564/609	565/612		4356-5	557/572 4356-2	569 4356-1	#5-82793 #3&4-82593 4356
1	ANALYSES	µg/L	πg/L	µg/L	μg/L	η/Bπ	η/βπ		πg/L	μg/L	μg/L	μg/L
	ОЯРН	100	1,000		<1,000 ^b	⁴ ,000,†>	<1,000. ^p		A N	<1,000 ^b	NA	<1,000
<u> </u>	GRРH	10	100		⁴ 20√5	<100. [‡]	<100. ¹⁰		NA A	ح+001 ₄	<100. ^p	<1007
<u> </u>	RRPH (Approx.)	200	2,000		<2,000	<2,000	<2,000		AN	<2,000	Ą	<2,000
<u> </u>	BTEX (8020/8020 Mod.)											
<u></u>	Benzene	0.1	1	5	V	⊽	V		<1 _c	Ÿ	V	₹
ن —	Toluene	0.1	1	1,000	⊽	⊽	7		۷ او	7	⊽	₹
-20	Ethylbenzene	0.1	,	700	⊽	7	V		\ \	7	⊽	₹
L.,	Xylenes (Total)	0.2	2	10,000	22	8	25		<2°	2	N V	<2
<u> </u>	HVOC 8010	0.1	1		⊽	٧	V		NA	٧	⊽	
<u> </u>	PCBs	0.2	2	0.5	<2	N V	~ 5		NA	<2	AN	<2.1
1												

Not analyzed. Result is an estimate. DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC. BTEX determined by 8260 method analysis.

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CT&E Data. F&B Data.

TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

Laboration Parameters Detect Limits Levels Levels Levels 258/10-10 Environmental Samples Environmental Samples 258/10-10 Environmental Samples Especial Samples 258/10-10 Environmental Samples Per Laboratory Samples Per	Y\TABLES	Installation: Point Lay Site: Deactivated Landfill (LF01)	(LF01)	Matrix: ξ Units: μ	Surface Water	_							
Luboratory Sample ID Limits Action Lubrates Eveds Lubrations SSW04 SSW04 <td>3\4109</td> <td></td> <td></td> <td></td> <td></td> <td>i</td> <td></td> <td>Environn</td> <td>ental Samples</td> <td></td> <td>Field Blanks</td> <td></td> <td>Lab</td>	3\4109					i		Environn	ental Samples		Field Blanks		Lab
Luborationy Sample ID Numbers Agg (Laboration) Sample ID Numbers	66130°	Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	2SW09	2SW10		AB01	2EB03	2TB03	Blanks
ANALYSES μg/L	I\TBL3-1	Laboratory Sample ID Numbers					4692-9	4692-10		4356-5	4692-17	4692-16	4356 4692
GAPH 100 <td></td> <td>ANALYSES</td> <td>μg/L</td> <td>μg/L</td> <td>μg/L</td> <td>μg/L</td> <td>η/gπ</td> <td>μg/L</td> <td></td> <td>μg/L</td> <td>μg/L</td> <td>μg/L</td> <td>μg/L</td>		ANALYSES	μg/L	μg/L	μg/L	μg/L	η/gπ	μg/L		μg/L	μg/L	μg/L	μg/L
GAPH 20 20 20 223° C220 C <		ОВРН	100	100		<1,000 ^b	181 ^{ad}	240 ^{ad}		NA	NA	NA	<100
VOC 9260 Amortholoroethene 1 5 <1 13 1.1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1<		GRРH	20	20		_q ros>	223ª	<20		NA	NA	AN	<20
Benzene 1 13 11 41 <th< td=""><td></td><td>VOC 8260</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>		VOC 8260											
Chloromethane 1 1 70 <1 5.5B 8.3B <1 4.6 3.1U 3.1		Benzene	1	1	5	^	13	1.1		^	^	^	^
cis-1,2-Dichloroethene 1 70 <1 5.5B <1 4.6 4.6 1.5 Dichlorodifiluoromethane 1 1 700 <1		Chloromethane	1				3.5B	8.3B		7	3.1U	3.10	1.09
Dichlorodifluoromethane 1 700 <1 58 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1		cis-1,2-Dichloroethene	-	1	70	⊽	5.5B	<u>۲</u>		Ÿ	4.6	1.5	
Ethylbenzene 1 700 <1 3.6 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	3-2	Dichlorodifluoromethane	-	-		7	28	^		7		⊽	
1 1 5 <1	21	Ethylbenzene	1	1	700	7	3.6	<u>۲</u>					
1 1 5 <1		p-Isopropyltoluene	1	-		7	1.3	^					
1 1 5 <1		Methylene Chloride		-	5		2.68			3.1	3.4	2.8	
1 1 1,000 <1		Tetrachloroethene	-	1	5	\ \	109	^					.
1 1 5 <1 2.9B <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1		Toluene	1	-	1,000	~	8.9	⊽		٧	⊽	⊽	₹
1 <1 <1 <1 <1		Trichloroethene	-	1	5		2.9B	7			1.7		⊽
		Trichlorofluoromethane	1	1			3.8	-		<1	-1	-	<1

CT&E Data.

F&B Data.

Not analyzed.

The analyte was detected in the associated blank. Result is an estimate.

Total petroleum hydrocarbons in these water samples exceed the 15 µg/L stated for fresh water in ADEC's Water Quality Criteria 18AAC70 (ADEC 1989). Compound is not present above the concentration listed.

DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC. The laboratory reported that the EPH pattern in this sample was not consistent with a middle distillate fuel.

04 MARCH 1996

TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Site: Deactivated Landfill (LE01)	(LF01)	Matrix: Surfi Units: #a/L	Matrix: Surface Water Units: 44/L								
						Environme	Environmental Samples		Field Blanks		Lab
Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	2SW09	2SW10		AB01	2EB03	2TB03	Blanks
Laboratory Sample ID Numbers					4692-9	4692-10		4356-5	4692-17	4692-16	4356 4692
ANALYSES	μg/L	μg/L	η/βπ	η/βπ	μg/L	μg/L		μg/L	η/Bπ	µg/L	η/bπ
1,2,4-Trimethylbenzene	-	-		^	9.3	~		^1	₹	7	⊽
1,3,5-Trimethylbenzene	-	-		<1	5.1						
Xylene	2	2		<2	2.07	<2		<2	<2	<2	<2

TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Site: Deactivated Lan	ation: Point Lay Deactivated Landfill (LF01)	Matrix: Units:	: Surface Water μg/L	Vater	METALS AN	METALS ANALYSES: TOTAL (DISSO	TOTAL (DISSOLVED)			
Parameters	Detect	Ottant	Action	Bkgd. Range		Envi	Environmental Samples	Fiel	Field Blank	Lab Blanks
	Limits	Limits	Levels	DEW Line Installations	SW04 & SW (Duplicates)	SW08 cates)			EB02	
Laboratory Sample ID Numbers	Ð				4358-1 4356-10	4358-4			4356-2	4358 4356
ANALYSES	μg/L	μg/L.	1/6#	μg/L	μg/L	μg/L			μg/L	µg/L
Aluminum	17.4	100		<100-350 (<100-340)	180 (<100)	<100 (<100)			<100 (<100)	
Antimony	N/A	100	9	<100 (<100)	<100 (<100)	<100 (<100)			<100 (<100)	<100
Arsenic	5.3	100	50	<100 (<100)	<100 (<100)	<100 (<100)			<100 (<100)	<100
Barium	1.2	50	2,000	<50-93 (<50-91)	210 (320)	200 (210)		=	<50 (<50)	<50
Beryllium	N/A	20	4	<50 (<50)	<50 (<50)	<50 (<50)			<50 (<50)	<50
Cadmium	1.7	50	5	<50 (<50)	<50 (<50)	<50 (<50)			<50 (<50)	<50
Calcium	34.5	200		4,500-88,000 (4,100-86,000)	81,000	83,000 (83,000)	-		410 (<200)	<200
Chromium	3.29	50	100	<50 (<50)	<50 (<50)	<50 (<50)			<50 (<50)	<50
Cobalt	N/A	100		<100 (<100)	<100 (<100)	<100 (<100)			<100 (<100)	<100
Copper	2.3	20	1,300	<50 (<50)	<50 (<50)	<50 (<50)			<50 (<50)	<50
lron	25	100		180-2,800 (<100-1,600)	32,000 (22,000)	33,000 (23,000)			<100 (<100)	<100

☐ CT&E Data. N/A Not available.

TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

<u> </u>	Installation: Point Lay Site: Deactivated Landfill (LF01)	dfill (LF01)	Matrix: Units:	c. Surface Water μg/L	Vater	METALS AN	METALS ANALYSES: TOTAL (DISSC	TOTAL (DISSOLVED)				
L	Daramotore	Detect	C	Action	Bkgd. Range from 7		Envi	Environmental Samples	amples	-	Field Blank	Lab Blanks
	200	Limits	Limits	Levels	DEW Line Installations	SW04 & SW (Duplicates)	SW08 ates)				EB02	
<u> </u>	Laboratory Sample ID Numbers					4358-1 4356-10	4358-4				4356-2	4358 4356
	ANALYSES	π ₉ /L	η/bπ	µg/L	μg/L	μg/L	η/6π				J/Bπ	μg/L
<u> </u>	Lead	9.9	100	15	<100 (<100)	<100 (<100)	<100 (<100)				<100 (<100)	<100
	Magnesium	47.8	200		<5,000-53,000 (2,600-54,000)	25,000 (25,000)	25,000 (25,000)				<200 (<200)	<200
	Manganese	1.24	50		<50-510 (<50-210)	940 (930)	(096) 096				<50 (<50)	<50
3.4	Molybdenum	A/N	90		<50 (<50)	<50 (<50)	<50 (<50)				<50 (<50)	<50
	Nickel	5.5	50	100	<50 (<50)	<50 (<50)	<50 (<50)				<50 (<50)	<50
	Potassium	1,154	5,000		<5,000 (<5,000)	8,000 (8,200)	8,100 (8,300)				<5,000 (<5,000)	<5,000
<u> </u>	Selenium	62.4	100	50	<100 (<100)	<100 (<100)	<100 (<100)				<100 (<100)	<100
	Silver	2.6	50	50	<50) (<50)	<501 (<50)	<507 (<50)J				<50 (<50)	<50
	Sodium	27.72	250		8,400-410,000 (8,200-450,000)	47,000 (49,000)	47,000 (47,000)				370 (400)	<250
	Thallium	0.57	5	2	<5 (<5)	<5 (<5)	<5 (<5)				<5 (<5)	<5
04 1	Vanadium	1.8	50		<50 (<50)	<50 (<50)	<50 (<50)				<50 (<50)	<50

CT&E Data.

//A Not available

Result is an estimate.

TABLE 3-1. DEACTIVATED LANDFILL ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Site: Deactivated Landfill (LF01)	y ndfill (LF01)		Matrix: Surface Water Units: μg/L	Water	METALS AN	METALS ANALYSES: TOTAL (DISSOLVED)	LVED)				
Doramotore	Detect	Ĉ	Action	Bkgd. Range		Enviror	Environmental Samples	amples	Fie	Field Blank	Lab Blanks
200	Limits	Limits	Levels	DEW Line Installations	SW04 & SW08 (Duplicates)	SW08 ates)				EB02	
Laboratory Sample ID Numbers					4358-1 4356-10	4358-4				4356-2	4358 4356
ANALYSES	μg/L	η/Bπ	η/bπ	J/6#	μg/L	η/Bπ				μg/L	ηg/L
Zinc	8.2	50		<50-160 (<50)	<50 (60)	<50 (<50)				<50 (<50)	<50

TABLE 3-2. IDENTIFICATION OF CHEMICALS OF CONCERN AT THE DEACTIVATED LANDFILL (LF01)

STE MATRIX CHEMICAL DETECTED CONCENTRATION UNITS PARAMETOR PARAMETOR rated Landfill Sediment DRPH 11.3 mg/kg <650-<100 CRPH 11.3 mg/kg <60.030-<0.150 Ethylbenzene 0.042 mg/kg <0.030-<0.150 Ethylbenzene 0.052 mg/kg <0.030-<0.150 Banzyl alcohol 1.38 mg/kg <0.030-<0.150 Naphthalene 0.067 mg/kg <0.030-<0.150 Tetrachlorosthene 0.052 mg/kg <0.030-<0.150 1.2.4-Trimethylbenzene 0.052 mg/kg <0.030-<0.150 Aluminum 2.400 mg/kg <0.030-<0.150 Copper Chromium 13 mg/kg <0.030-<0.150 Lead Too mg/kg 5.400-55.00 Lead 1.3 mg/kg <0.030-0.150 Manganese 200 mg/kg <0.030-0.150 Lead 1.3 mg/kg <0.030-0.150 Manganese <td< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th>ă.</th><th>RBSL[®]</th><th></th><th>TACIMEN O</th></td<>							ă.	RBSL [®]		TACIMEN O
Sediment DRPH ES4 mg/kg c c c c c c c c c c c c c c c c c c	SITE	MATRIX	CHEMICAL DETECTED	CONCENTRATION	UNITS	BACKGHOUND	CANCER	NON-CANCER	ARAR	CONCERN
GRPH 11.9 mg/kg <3	Deactivated Landfill	Sediment	DRPH	624	mg/kg	<50-<100	1		500°	Yes
0.042 mg/kg	(LF01)		GRРH	11.9	mg/kg	<3J-<4J	1	1	100°	No
1.38 mg/kg			Toluene	0.042	mg/kg	<0.030-<0.150	1	5,400	-	N _o
Inality CO.030- Inality CO.030- Lene 0.067 mg/kg CO.030- ene 0.067 mg/kg CO.030- ene 0.727 mg/kg CO.030- lbenzene 0.552 mg/kg CO.030- lbenzene 0.342 mg/kg CO.030- lbenzene 0.346 CO.030- CO.030- lbenzene 0.346 CO.030- CO.030- lbenzene 0.346 CO.030- Mg/kg CO.030- lbenzene 0.346 Mg/kg CO.030- CO.030- lbenzene 0.346 Mg/kg CO.030- CO.030-<			Ethylbenzene	0.054	mg/kg	<0.030-<0.150	1	2,700	1	S
loohol 1.38 mg/kg <6.9			Xylenes (total)	0.724	mg/kg	<0.030-<0.150	•	54,000	1	Š
pyltoluene 0.067 mg/kg <0.030-		· 	Benzyl alcohol	1.38	mg/kg	<6.9-<15.0	•	8,100	1	No.
lene 0.409 mg/kg <0.030-			p-IsopropyItoluene	0.067	mg/kg	<0.030-<0.150	1	1	ł	Yes*
noethene 0.727 mg/kg <0.030-			Naphthalene	0.409	mg/kg	<0.030-<0.150	I	1,100	:	S.
methylbenzene 0.552 mg/kg <0.030-			Tetrachloroethene	727.0	mg/kg	<0.030-<0.150	1.23	270	1	S.
methylbenzene 0.342 mg/kg <0.030-			1,2,4-Trimethylbenzene	0.552	mg/kg	<0.030-<0.150	-	1	1	Yes*
m 2,400 mg/kg 1,500-3 lm 260 mg/kg 360-3 lm 13 mg/kg lum 70,000 mg/kg 5,400-3 lum 1,900 mg/kg 5,400-3 ese 220J mg/kg 360-3 lum 280 mg/kg 360-3 lum 280 mg/kg <300-3			1,3,5-Trimethylbenzene	0.342	mg/kg	<0.030-<0.150	ŧ	•	-	Yes*
260 mg/kg 360-1 Im 6,300 mg/kg 360-1 Im 13 mg/kg 70,000 mg/kg 5,400-1 Ium 1,900 mg/kg 360-1 Im 1,900 mg/kg 360-1 Im 1,900 mg/kg 360-1 Im 280 mg/kg 360-1 Im 280 mg/kg <300-1			Aluminum	2,400	mg/kg	1,500-25,000	t	:	-	S _N
Im 6,300 mg/kg 360-360-360-360 Im 13 mg/kg Im 70,000 mg/kg 5,400-360-360 Im 1,900 mg/kg 360-360-360 Im 13 mg/kg 360-360-360 Im 280 mg/kg <300-300 <300-300			Barium	260	mg/kg	27-390	1	1,890	1	8
Image Image Image Image 55 mg/kg 5,400- 10m 1,900 mg/kg 360- 10m 1,900 mg/kg 360- 10m 13 mg/kg 360- 10m 13 mg/kg 330- 10m 13 mg/kg <300- 10m 10m 10m <300- 10m 10m <300- <300- <t< th=""><th></th><th></th><th>Calcium</th><th>008'9</th><th>mg/kg</th><th>360-59,000</th><th>į.</th><th>•</th><th>1</th><th>%</th></t<>			Calcium	008'9	mg/kg	360-59,000	į.	•	1	%
55 mg/kg			Chromium	13	mg/kg	<4.3-47	1	135	Î	9 N
1 70,000 mg/kg 5,400- nesium 1,900 mg/kg 36C ganese 220J mg/kg 36C el 13 mg/kg 38C ssium 280 mg/kg <30C			Copper	92	mg/kg	<2.7-45	* !	666	1	ON.
esium 1,900 mg/kg 360 and see 320J mg/kg 360 and see 320J mg/kg 360 and sium 280 mg/kg <300			Iron	000'02	ша/ка	5,400-35,000	:	•	1	N _o
sium 1,900 mg/kg 360 nese 220J mg/kg 13 mg/kg <300 ium 280 mg/kg <300			Lead	18	mg/kg	<5.1-22	•	:	500 ^d	No
13 mg/kg 13 mg/kg 13 mg/kg 1300 mg/kg 1300			Magnesium	1,900	mg/kg	360-7,400	1	1	1	No
13 mg/kg <300 ium 280 mg/kg <300			Manganese	220J	mg/kg	25-290	1	3,780	ŀ	ON
280 mg/kg <:			Nickel	13	mg/kg	4.2-46	t	540	I	ON.
			Potassium	280	mg/kg	<300-2,200	1	1	1	°N
Sodium 120 mg/kg <160-680			Sodium	120	mg/kg	<160-680	1	ı	1	No

TABLE 3-2. IDENTIFICATION OF CHEMICALS OF CONCERN AT THE DEACTIVATED LANDFILL (LF01) (CONTINUED)

						œ	RBSL ^a		
SITE	MATRIX	CHEMICAL DETECTED	MAXIMUM	UNITS	BACKGROUND RANGE	CANCER	NON-CANCER	ARAR	CHEMICAL OF CONCERN
Deactivated Landfill	Sediment	Vanadium	11	mg/kg	6.3-59	•	189	1	No
(LF01)	(Continued)	Zinc	380	mg/kg	9.2-95	1	8,100	1	No
(Continued)	Surface Water	ОЯРН	240	μg/L	<1,000	ı	292	ľ	No
		GRPH	223	μg/L	<501	50	730	1	Yes
		Benzene	23	μg/L		0.617	•	5°	Yes
		Toluene	6	μg/L	<1		96.5	1,000 ^e	No
		Ethylbenzene	13J	μg/L	<1	1	158	700°	No
		Xylenes (total)	21.7	µg/L	<2	1	7,300	10,000 ^e	N _o
		Dichlorodiffuoromethane	58	μg/L	<1		51.7	1	Yes
		cis-1,2-Dichloroethene	6.9	μg/L	<1.0	•	36.5	70e	N _O
		p-isopropyitoluene	1.7	η/6π	-1>	1	1	1	Yes*
		Naphthalene	3.4J	μg/L	· ·	:	150	-	No
		Tetrachloroethene	109	η/6π	^	0.143	36.5	5	Yes
		Trichloroethene	3.3	η/6π	7	0.25	1	5	Yes
		Trichlorofluoromethane	3.8	μg/L	7	:	165	-	Š
		1,2,4 Trimethylbenzene	10	μg/L		:	ı	1	Yes*
		1,3,5 Trimethylbenzene	6.7	μg/L	<1	:	1	1	Yes*
		Aluminum	180	η/6π	<100-350	1	3	:	N _o
		Barium	210	η/Bπ	< 50-93	1	256	2,000 ^h	N _O
		Calcium	83,000	πg/L	4,500-88,000	1	:	ł	N _o
		Iron	33,000	η/6π	180-2,800	1	1	I	_S
		Magnesium	25,000	πg/L	<5,000-53,000	1		-	No

TABLE 3-2. IDENTIFICATION OF CHEMICALS OF CONCERN AT THE DEACTIVATED LANDFILL (LF01) (CONTINUED)

						R	RBSL ^a		1400
SITE	MATRIX	CHEMICAL DETECTED	MAXIMUM CONCENTRATION	UNITS	BACKGHOUND RANGE	CANCER	NON-CANCER	ARAR	CONCERN
Deactivated Landfill	Surface Water	Manganese	096	η/Bπ	<50-510	1	18.3		Yes
(LF01)	(Continued)	Potassium	8,100	1/B#	000'5>	•	:		No
(Continued)		Sodium	47,000	μg/L	8,400-410,000	1	1	ŧ	N

The COCs selected for the site do not include metals that are considered essential human nutrients or analytes that do not have an RBSL or ARAR; however, these chemicals were discussed in the Point Lay Risk Assessment (U.S. Air Force 1996).

Risk-Based Screening Level.

Applicable or Relevant and Appropriate Requirement.

ADEC 1991. EPA 1991c.

0 0 Φ

MCL, 56 FR 3526 (30 January 1991). MCL, 52 FR 25690.

57 FR 31776 (17 July 1992).

MCL, 56 FR 30266 (01 January 1991).

The concentrations reported for metals in surface water are total metals. The analyte was detected in the associated blank.

Result is an estimate.

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3.2 **GARAGE (SS06)**

3.2.1 Site Background

The Garage (SS06) site is located approximately 250 feet north of the module train. The Garage is an approximately 90 feet by 40 feet building elevated about 5 feet above the tundra and is surrounded by gravel on the north, east, and south sides. The building is used for vehicle maintenance and storage. Floor drains in this building discharged directly to the tundra beneath the structure and may have received vehicle maintenance waste. The floor drains were sealed by the Air Force in July 1993 to prevent the possibility of future release of contaminants.

The site-specific environmental setting describing the topography, surface water drainage, and soil types is presented in the discussion of potential migration pathways, Section 3.2.3.

3.2.2 Field Sampling and Analytical Results

This section describes the RI sampling and analytical results for samples collected at the Garage (SS06) site. The discussion presents a review of laboratory data, data summary tables, contaminants identified, contaminant trends, and information on suspected source areas.

3.2.2.1 Summary of Samples Collected. A total of 24 samples was collected during the RI from gravel pads, tundra, ponds, and streams at the site. These consisted of 14 soil, 7 sediment, and 3 surface water samples. Table 2-2 presents a detailed summary of the samples collected and the analyses performed during the 1993 RI field activities. Locations of all samples collected at the Garage (SS06) site are presented in Figure 3-2.

Fourteen soil samples were analyzed for DRPH and GRPH. In addition, 13 samples were analyzed for BTEX. Nine samples were analyzed for RRPH, HVOCs, and PCBs, and three samples were analyzed for VOCs and SVOCs. Two samples were analyzed for total metals.

Seven sediment samples were analyzed for DRPH, GRPH, and BTEX. In addition, four samples were analyzed for RRPH, HVOCs, and PCBs. Three samples were analyzed for VOCs and SVOCs.

Three surface water samples were analyzed for DRPH, GRPH, RRPH, and BTEX. In addition, two samples were analyzed for HVOCs. One sample was analyzed for VOCs, SVOCs, and total and dissolved metals.

3.2.2.2 Analytical Results. The data summary table (Table 3-3) presents analytical results for all samples collected at the site. Detection and quantitation limits, action levels, associated laboratory and field blanks, and background analytical results are presented for each of the analyses. Background levels are listed to allow direct comparison of naturally occurring organic compounds and inorganic analytes with samples collected from the site. Sample locations and analytical results for the samples at the site are illustrated in Figure 3-2. All organic compounds detected are presented on the figure except when they were a result of laboratory contamination or decontamination procedures. Only metals detected above background levels

that exceed an RBSL or ARAR are presented on Figure 3-1. The exceptions are presented on the data summary table.

The following section presents a discussion of organic compounds and inorganic analytes detected above background levels at the site.

Organics. Organic compounds detected in soil and sediment samples at the site include DRPH, GRPH, RRPH, BTEX compounds, and ten other VOCs. DRPH were detected in 16 soil/sediment samples ranging from 4.61 to 33,400 mg/kg. GRPH were detected in 14 samples ranging from 0.607 to 937 mg/kg. RRPH were detected in five samples ranging from 620 to 40,000 mg/kg. BTEX compounds were detected in 11 soil/sediment samples. Total BTEX ranged from 0.031 to 60 mg/kg; xylenes were the primary component. Ten other VOCs were detected in six soil/sediment samples at concentrations ranging from 0.021 to 43 mg/kg. The primary VOC detected was tetrachloroethene (43 mg/kg).

In surface water samples collected from the site, organic compounds detected are limited to two VOCs. The two VOCs (naphthalene and 1,3,5-trimethylbenzene, both common components of diesel fuel) were detected at low levels (2.1 and 1.2 μ g/L, respectively).

Inorganics. In soils, metals analyses indicated that two metals (chromium and lead) were detected above background levels at the site. Chromium was detected at 54 mg/kg (sample SS06-S08), and lead was detected at 92 and 195 mg/kg (samples SS06-S03 and SS06-S08, respectively).

In surface water samples, three metals (barium, iron, and manganese) were detected above background concentrations.

3.2.2.3 Summary of Site Contamination. The primary contaminants at the site are petroleum hydrocarbons (DRPH, GRPH, and RRPH), VOCs commonly associated with diesel fuel, and solvents. The suspected source of contaminants detected during sampling conducted at the Garage site is POL wastes discharged to the building floor drains and from previous spills and/or leaks. The drains were sealed by the Air Force in 1993 to prevent further release of contaminants. No previous IRP sampling is known to have been conducted at the site. The human health and ecological risks associated with the chemicals detected at the site are presented in Sections 3.2.4 and 3.2.5. Based on field data, source of contamination, and concentrations of contaminants, the area of affected media includes approximately 300 square feet of gravel, approximately 27,700 square feet of tundra, and approximately 4,000 square feet of soil underneath the building.

3.2.3 Migration Pathways

This section describes the topography and stratigraphy of the site and the migration potential of contaminants from the site. A discussion of receptors and chemical concentrations at receptors is included.

3.2.3.1 Topography and Stratigraphy. The natural topography in this area slopes gently to the west but is generally flat. Gravel pads and roads are the most significant topographic features at the site. The gravel pad adjacent to the Garage is approximately seven feet above natural grade, and roads range from approximately three to seven feet above natural grade. The most prominent drainage feature in the area is a small stream that begins just west of the garage, which flows west through a culvert under a road and into the tundra.

During the 1993 RI, permafrost was located at a depth of up to six feet under the gravel pads and at a depth of two feet under tundra areas. Gravel pads consisted of the typical gravels and sands associated with these features, and subsurface tundra materials were of the typical stratigraphy found at Point Lay (Section 2.4.4.2).

3.2.3.2 Migration Potential.

Subsurface Migration. Analytical data indicate that soil and sediments at the site have been contaminated with DRPH, GRPH, BTEX, and VOCs. Although surface water samples collected from these features during the RI were not significantly contaminated, the presence of contaminated sediments suggests that contaminated surface water has previously affected these features. The sediment samples were collected from soggy tundra areas (without a defined stream) and a small stream that infiltrates into the tundra. Surface water in these features may drain into the subsurface, and any contaminated water that may have been present may have entered the active layer. This suggests a potential for subsurface migration of contaminants to occur at the site. The local topography indicates that drainage in the active layer is westward towards Kasegaluk Lagoon, located approximately 850 feet west of the garage building.

Surface Migration. Analytical data indicate that the small stream which drains the Garage site has been contaminated with DRPH, GRPH, BTEX, and VOCs. Because this stream infiltrates into the tundra near the western border of the site, the stream is probably limited to onsite migration of contaminants. Offsite migration in surface water is probably restricted to the spring thaw, when an abundant supply of meltwater and reduced infiltration may increase the flow in this stream. Based on these considerations, the potential for offsite contaminant migration in surface water is considered to be limited. The presence of petroleum compounds (DRPH, GRPH, and RRPH) in the tundra north of the Garage (i.e., sample SS06-2SD05, Figure 3-2) indicates that petroleum hydrocarbons have migrated from the Garage to the tundra immediately north. Subsurface migration from the Garage is limited because the elevation of the gravel pad causes a dike effect (Figure 2-6). Drainage in the tundra immediately north of the Garage is sluggish because of the flat topography, as indicated by the analytical data, and the potential for migration of contaminants from the affected tundra is considered to be minimal.

Air Transport. Air transportation is not considered to be a significant mode of migration at the site (Section 2.4.4.5).

Summary of Migration Potential. Analytical data for the site suggest that some onsite migration of contaminants has occurred. Because the only stream that drains the Garage area infiltrates into the subsurface before leaving the site, the potential for offsite migration in surface water is considered to be limited. Offsite migration in surface water is probably limited to the spring thaw.

The migration of contaminants in the subsurface is possible; however, the movement of active zone water in the area is sluggish.

3.2.3.3 Receptors and Chemical Concentrations at Receptors.

Human Receptors. Potential human receptors at the Garage site include Air Force contractor personnel working at the station, visitors to the station, and an occasional local visitor passing the site to get to recreational or subsistence lands. Human receptors could potentially be exposed to the chemicals detected in surface water and soil/sediments at the site. The primary routes of potential exposures at the site are direct contact with soil/sediment, incidental ingestion of soil/sediment, and ingestion of surface water. Because ground water and air at the Point Lay sites are not considered complete pathways of exposure, these media are not evaluated as potential pathways to human receptors.

The Point Lay Risk Assessment (U.S. Air Force 1996) evaluates in detail the risks to human health from all COCs detected at the site. The potential receptor groups were selected based on their likelihood of exposure to contaminants at the site and include DEW Line workers at the installation, and native adults and children who may visit the site. The estimated exposure point concentrations for human receptors are based on the maximum concentration of each chemical detected at the site. The potential risks to human health associated with chemicals at Point Lay are presented in Section 3.2.4.

Ecological Receptors. Ecological receptors were evaluated in detail in the Point Lay Risk Assessment (U.S. Air Force 1996) to determine if plants and animals could potentially be impacted by the chemicals detected at the Point Lay installation. Because of the diversity of the plants and animals in the area of the Point Lay installation, a set of representative species was selected in the ERA for detailed evaluation. The species include plants, aquatic invertebrates, fish, birds, and mammals. These receptors were selected based on the species' likelihood of exposure given their preferred habitat and feeding habits. The representative species encompass a range of ecological niches in order to achieve the best characterization of the ecosystems being examined and are presented in Table 2-6.

The estimate of chemical concentrations at the ecological receptors was based on the average site-wide concentration of each COC. This approach was appropriate because few of the representative species would inhabit only one distinct site at the installation; they are more likely to be exposed to the mix of chemicals and concentrations detected on all the sites at Point Lay. The potential ecological risks associated with the chemicals detected at the site are presented in Section 3.2.5.

3.2.4 Human Health Risk Assessment

This section presents a summary of the potential human health risks associated with the chemicals detected at the Garage (SS06) site. The purpose of the human health risk assessment is to quantify the excess lifetime cancer risk and/or the noncancer hazard (reported as hazard index) from the chemicals detected at the site.

This summary presents the COCs at the site, the pathways by which human receptors may be exposed to site chemicals, potential risks to human health posed by each chemical through each exposure pathway, the significance of the risk and/or hazard estimate, and a comparison of site chemical concentrations to ARARs. The methods and assumptions used in calculating hazards and risks are presented in Section 2.4.1.

3.2.4.1 Chemicals of Concern. At the Garage (SS06), COCs identified for the soil/sediment matrix included DRPH, RRPH, GRPH, trichloroethane, and tetrachloroethene. The maximum concentrations of DRPH, GRPH, and RRPH exceeded the background concentrations and the ARAR concentrations for petroleum hydrocarbon contamination of soil (ADEC 1991). Tetrachloroethene exceeded the background concentration and the RBSL based on cancer risk.

Barium and manganese were identified as a COC for the surface water at the Garage. Barium exceeded the RBSL based on noncancer hazard but did not exceed the ARAR which is an MCL promulgated under the federal Safe Drinking Water Act. Manganese exceeded the background concentration and the RBSL based on noncancer hazard.

Table 3-4, Identification of COCs at the Garage, presents the maximum concentrations of chemicals detected at the site, the associated background concentrations, RBSLs, and ARARs, and identifies COCs selected in the risk evaluation.

3.2.4.2 Exposure Pathways and Potential Receptors. Because COCs were identified for soil/sediment and surface water at the site, the potential risks associated with ingestion of soil/sediment and surface water were evaluated in the risk assessment.

Three potential receptor groups were evaluated in the risk assessment: an adult assigned to a DEW Line installation (worker), an adult inhabitant of communities in the North Slope of Alaska (native), and a child living in a North Slope community (child).

3.2.4.3 Risk Characterization.

Noncancer Hazard and Cancer Risk Associated with Soils and Sediments. The noncancer hazard associated with the ingestion of soil at the Garage by a hypothetical native northern adult/child is 1.1, and by a DEW Line worker is 0.05, based on the maximum concentrations of the COCs. The presence of DRPH, GRPH, RRPH, trichloroethane, and tetrachloroethene entirely accounts for the quantifiable noncancer hazard for these receptor/pathway combinations. DRPH and RRPH together account for more than 90 percent of the noncancer hazard.

The excess lifetime cancer risk associated with the ingestion of soil or sediment at this site by a hypothetical native northern adult/child is 7×10^{-7} , and by a DEW Line worker is 3×10^{-8} , based on the maximum concentrations of the COCs. The presence of GRPH, trichloroethane, and tetrachloroethene entirely accounts for the quantifiable excess lifetime risk for these receptor/pathway combinations.

Noncancer Hazard and Cancer Risk Associated with Surface Water. The noncancer hazard associated with the ingestion of surface water at the Garage by a hypothetical native northern

adult or by a DEW Line worker is 4.9, based on the maximum concentrations of the COC. Manganese and barium account for the quantifiable noncancer hazard for these receptor/pathway combinations. Manganese alone accounts for 99 percent of the noncancer hazard.

No carcinogenic COCs were identified for the surface water at this site; therefore, the excess lifetime cancer risk associated with ingestion of surface water cannot be quantified.

3.2.4.4 Summary of Human Health Risk Assessment. The potential risks and hazards associated with the soil/sediment at the Garage site are the low noncancer hazard (hazard indices of 1.1 and 0.05), and very low cancer risk associated with GRPH and tetrachloroethene. These risks and hazards were calculated conservatively based on ingestion of soil at a rate associated with a residential scenario. It is very unlikely that the soil at this location would be ingested at the conservative rate used in the risk calculation, and the hazards and risks at the site are likely to be overestimated. Remedial action is generally not warranted at sites where the excess lifetime cancer risk is less than 1 x 10⁻⁴ or the noncancer hazards do not significantly exceed one, and on the basis of the risk assessment remediation of the site is not necessarily warranted.

The potential hazards associated with the surface water at the Garage site are the low hazard indices of 4.9 for both the native northern adult and a DEW Line worker. The noncancer hazard is associated with the levels of manganese and barium detected in surface water. The noncancer hazards in surface water were calculated assuming the affected surface water would be used as a sole-source water supply for 180 days per year. Based on site-specific information, the above mentioned chemicals detected in surface water do not currently pose a health hazard nor are they likely to pose a hazard in the future. The surface water expressions at the site are frozen most of the year; many are only intermittently filled with water during the summer months. The surface water at the site is not known to be used as a water supply now, nor has it been used in the past.

In conclusion, under current uses the COCs identified in soil/sediment and surface water at the Garage site pose only a minimal, if any, potential threat to human health. Based on the human health risk assessment, remedial actions are not warranted at the site. In the unlikely event that surface water at the site is used as a sole-source drinking water supply in the future, a potential noncancer hazard to human health could exist if current conditions remain constant.

3.2.5 Ecological Risk Assessment

The objective of the ERA is to estimate the potential impacts of chemicals detected at the installation on aquatic and terrestrial plants and animals. A summary of the methods used to assess potential ecological impacts is presented in Section 2.4.2.

3.2.5.1 Chemicals of Concern. COCs were selected based on criteria presented in Section 3.1 of the ERA. The average installation-wide concentration of COCs were used to calculate the risk assessments. All sites at the installation were considered to be potentially usable habitat. It should be noted that the COC selection process only considered the

soil/sediment samples that were at or less than 1.5 feet deep. The soil/sediment samples were screened for depth because it is unlikely that any of the representative species will be exposed to soils/sediments deeper than 1.5 feet. Iron and manganese were identified as COCs in surface water, and the COCs in soil/sediments at the Garage site were DRPH, GRPH, RRPH, BTEX, tetrachloroethene, trichloroethane, trichloroethene, lead, and zinc. None of the identified COCs was associated with significant risk estimates at the Garage site.

3.2.5.2 Summary of Ecological Risk Assessment. Based on the quantification of potential risks to ecological receptors and discussions presented in the Point Lay ERA, ecological risks at the Garage site are minimal.

3.2.6 Conclusions and Recommendations

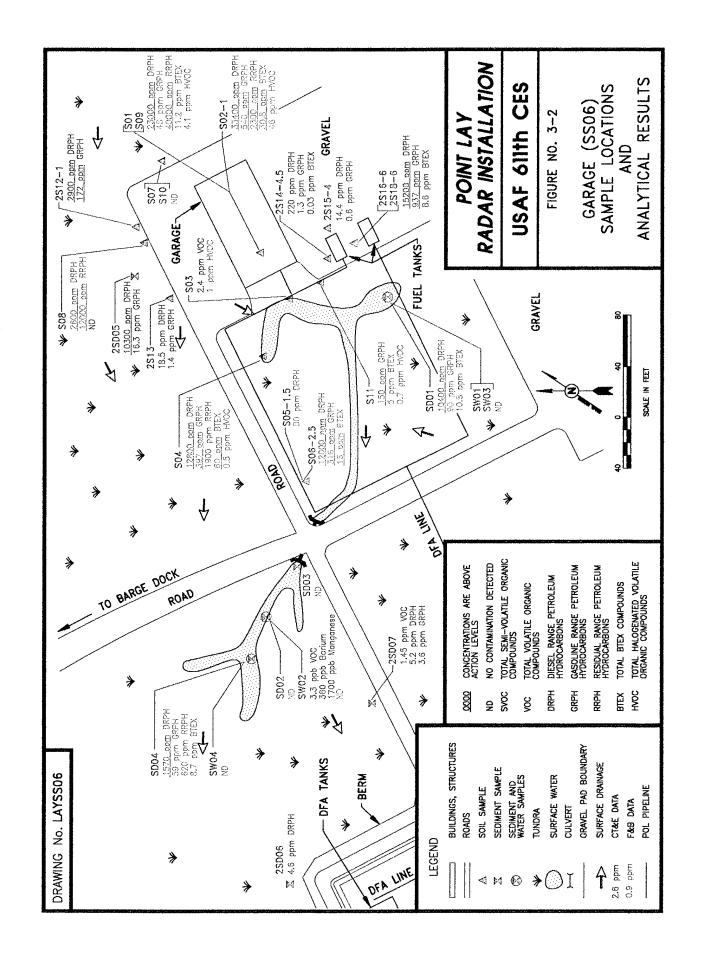
Sampling and analyses have determined that the Garage (SS06) site is contaminated with petroleum hydrocarbons (DRPH, GRPH, and RRPH), BTEX compounds, other VOCs that are components of diesel fuel, and solvents. The contaminated areas at the site are soil/sediment and surface water. The area beneath the Garage has the highest concentrations of affected soil. Contaminant concentrations decrease with distance from the Garage. The suspected source of contamination is POL wastes previously discharged to the building floor drains.

Migration of contaminants from the site appears to have occurred via surface and subsurface pathways from the gravel pad and the area below the Garage to the surrounding gravel and tundra areas.

The risk assessment concluded that risks posed to human health and ecological receptors by site contaminants are minimal given current site uses. Under a future scenario, using the surface water in the drainage pathways from the site as a drinking water supply results in a low potential risk to human health. The human health risk, however, is not of a magnitude that normally requires remedial action. The ERA concluded that the overall potential risks presented by site contaminants are minimal. Therefore, under current and future site conditions and considering the findings of the risk assessment, remediation of the site is not necessarily warranted.

Levels of petroleum compounds (DRPH, GRPH, and RRPH) detected in soil/sediment at the site significantly exceed ADEC guidance cleanup levels. In addition, site contaminants have migrated downgradient and have impacted soil/sediment and surface water. Therefore, the site is being recommended for remedial action. The affected areas at the site include approximately 4,000 square feet beneath the building, approximately 300 square feet of gravel between the fuel tanks south of the Garage, and approximately 27,700 square feet of tundra located southwest of the Garage. The remedial action alternative recommended for the gravel between the fuel tanks, the soil beneath the building, and the tundra is enhanced bioremediation. A complete description and evaluation of the remedial alternatives recommended for this site are presented in the FS, Section 4.0.

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TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY

Installation: Point Lay Site: Garage (SS06)	Point Lay (SSO6)	Matrix: Units:	: Soil mg/kg													
							En	Environmental Samples	σ				Field Blanks			Lab
Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	S01 & S09 (Replicates)	S09 ates)	S02-1	S03	S04	805-1.5	S06-2.5	AB01	EB02	TB02	Big	Blanks
Laboratory Sample ID Numbers					636	652	638	640 4354-4	642	644	646	4356-5	557/572 4356-2	569 4356-1	#5-82793 #3&4-82593 4356	#5-82593 #182-82593 4354
ANALYSES	mg/kg	mg/kg	mg/kg	шд/ка	mg/kg	mg/kg	тд/кд	mg/kg	mg/kg	mg/kg	mg/kg	η _β η.	µg/L	1/6rt	J/6rl	тд/кд
DRPH	8	99	2009	<50°+<100°	23,000.P	18,000J ⁰	33,400.1 ²	. e90³	12,800. ⁰	BoJ ⁵	12,000u ^b	NA	<1,000 ^b	NA	<1,000	<50
GRPH	3.4-3.7	34-37	100	gf#≻-gf£>	255.J ^b	48J ⁵	grops	<a7.1<sup>5</a7.1<sup>	397.0	<34J ⁵	316.1	NA	< 100.P	<100. ^p	<100R	, 11
RRPH (Approx.)	16-18	160-180	2,000 ^a	pot>	40,000	40,000	2,300	<180	1,900	c160	8	N A	<2,000	NA	<2,000	< 100
BTEX (8020/ 8020 Mod.)			10 Total BTEX	DZ-0>-£1:0>	<0.10	11.24	30.63	<0.15	60	<4.0.J	16.3					:
Benzene	0.002-0.05	0.02-0.5	0.5	*C05-<0.04	Z0*D>	E00>	<0.00	£0.0>	<0.03	<0.5J	<0.43	<1 ^c	1>	۲>	^ 1	< 0.02
Toluene	0.002-0.05	0.02-0.5		<0.02-<0.04	<0.02	20	n	CD 03	4	<0.5	<0.4	√1 c	41	< 1	۲	<0.02
Ethyl- benzene	0.002-0.2	0.02-2.0		+0.03-<0.04	<0.02	3	G.B	<0.03	\$F	<201	3	<1 ^c	7	T.	₹	<0.02
Xylenes (Total)	0.004-0.1	0.04-1.0		<0.04-<0.08	×0.04	æ	78	90°0>	ğ	73 V	Æ	<2 _c	2 5	25	<2	<0.04
HVOC 8010																
Tetrachlo- roethene	0.002-0.004	0.02-0.04		*0.03-<0.04	1.32	F14	43.1	1.1	caces	<0.03J	/*0°0×	NA	*	Ÿ	₹	<0.02J
Trichloro- ethane	0.002-0.004	0.02-0.04		4003-4004	187	reop>	£1	reas	7 S O	/E0:0>	CD 047	N A	*	, v	⊽	<0.02J
Trichloro- ethene	0.002-0.004	0.02-0.04		<0.03-¢0.04	7	<0.03J	22	<0.03J	e¢0.03J	~0.03 °1	ሩወወፋን	AN A	<1	₹	٧	<0.02J

CT&E Data. F&B Data.

Not analyzed. Result is an estimate.

Result has been rejected.

The action levels for DRPH and RRPH are based on conversations with ADEC; final action levels have not yet been determined.

DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.

BTEX determined by 8260 method analysis.

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TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Site: Garage (SS08)	Point Lay (SS06)	Matrix: Units:	Soil mg/kg													
							En	Environmental Samples					Field Blanks		Lab	0
Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	S01 & S09 (Replicates)	S09 ates)	S02-1	S03	S04	S05-1.5	S06-2.5	AB01	EB02	TB02	TE LE	KS
Laboratory Sample ID Numbers					636	652	638	840 4354-4	642	644	648	4356-5	557/572 4356-2	569 4356-1	4358	4354
ANALYSES	тв/ка	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/L	1/6#	1,6√L	ng/L	mg/kg
VOC 8260																
cis-1,2- Dichloro- ethene	0.020	0.020		<0.030-<0.150	NA	V.	A A	0.022J	N A	NA	AN.	7	٢	⊽	₹ .	< 0.020
p-Isopro- pyltoluene	0.020	0.020		<0.030-<0.150	NA	NA	N A	0.0423	¥.	₹	NA A	۲	⊽	7	⊽	<0.020
Ethyl- benzene	0.020	0.020		<0.030-<0.150	NA	NA	NA	0.023J	AN.	Ϋ́	NA V	۲	⊽	۲		<0.020
Methylene Chloride	0.020	0.020	8	<0.030-<0.150	NA	NA	Y Y	0.023BJ	AN.	¥.	NA	3.1	2.3	12	⊽	<0.020
Naph- thalene	0.020	0.020		<0.030-<0.150	NA	NA	NA	0.158J	A N	¥ Z	AN A	2		₹		<0.020
Tetrachlor- oethene	0.020	0.020		<0.030-<0.150	NA	A A	NA A	0.359J	NA	ΑN	NA	2	⊽	٢	^	<0.20
Toluene	0.020	0.020		<0.030-<0.150	NA	NA	ΝA	0.094J	NA	¥	ΑN	^	7	۲	7	<0.020
1,2,4-Tri- methyl- benzene	0.020	0.020		<0.030-<0.150	ΝA	NA	A A	0.315J	Ϋ́	N	NA		7	₽	⊽	<0.020
1,3,5-Tri- methyl- benzene	0.020	0.020		<0.030-<0.150	NA	NA	N A	0.497J	Y Y	NA	NA	₹	· ·	₹	7	<0.020
Xylenes (Total)	0.040	0.040		<0.060-<0.300	A A	A A	AN	0.849J	A	NA	Y Y	°	<2	6	8	<0.040
SVOC 8270	0.200	2.20		<6.9-<15.0	NA	Y.	NA	<2.20	NA A	NA	NA	NA	<25	NA NA	<10	<0.200

CT&E Data.
Not analyzed.
The analyte was detected in the associated blank.
Result is an estimate.

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TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Site: Garage (SS06)	oint Lay (SS06)	Matrix Units:	Matrix: Soil Units: mg/kg													
							Ē.	Environmental Samples	ø				Field Blanks		dal	ρ
Parameters	Detect. Limits	Quant. Limits	Action	Bkgd. Levels	S01 8 (Repli	S01 & S09 (Replicates)	1-205	cos	S04	S05-1.5	S08-2.5	AB01	EB02	1802	Bla	ıks
Laboratory Sample ID Numbers					636	852	809	640 4354-4	642	644	648	4356-5	557/572 4356-2	569 4358-1	4356	4354
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µ9/L	µg/L	л6/Г	µg/L	mg/kg
Pesticides	0.002-0.05	0.02-0.5		<0.023-40.53	NA	WA	ΥN	(\$0>-120°0>	NA	NA	NA	NA	<0.24<10J	NA	NA	<0.2J-<50J
PCBs	0.01-0.05	0.1-0.5	10	±0.1	<0.5	5.0.5	\$0>	<0.1	<0.1	<0.1	<0.2	NA	42	NA A	<2J	<0.1

F&B Data. Not analyzed. Result is an estimate.

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TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Site: Garage (SS06)	Matrix: Units:	Soil mg/kg											
						Environmer	Environmental Samples			Field Blanks		Lab	
Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	S07 & S10 (Replicates)	So7 & S10 Replicates)	808	S11	AB01	EB02	TB02	BIANKS	S
Laboratory Sample ID Numbers					648	654	650 4354-5	656	4358-5	557/572 4356-2	569 4356-1	#3&4-82593 #5-82793 4356	#5-82593 #182-82593 4354
ANALYSES	mg/kg	та/ка	шд/ка	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	J/Brl	µg/L	J/6rl	µg/L	шд/кд
DRPH	6-7	02-09	500 ³	<50 ² .<100 ³	⁶ 04>	جون _گ	2,600,1	47,600u [₽]	NA	<1,000	NA	<1,000	<50
GRPH	0.5-4	5-40	61	جهاع ⁴ 33	-40g	d See J ⁰	ς5Ω ^β	1501	NA	<100. [₽]	< 100 ¹⁹	<1001	<1J
ВВРН (Арргох.)	t t	<u>8</u>	2,000 ^a	<100	<160	< 100	12.000	×130	NA A	\$2,000	NA	<2,000	< 100
BTEX (8020/8020 Mod.)			10 Total BTEX	<0.13<0.20	<2.4J	<243	50.65	P.0.5					
Benzene	0.002-0.06	0.02-0.6	0.5	<0.02-<0.04	-a6J	£80>	ED 05	20:02	<1 ^C	Ÿ	Ÿ	₹	<0.02
Toluene	0.002-0.06	0.02-0.6		<0.02-<0.04	90>	90>	£0.0>	20 O S	<1 ^c	Ÿ	Ÿ	₹	<0.02
Ethylbenzene	0.002-0.06	0.02-0.6		×0.03-<0.04	19:0>	rga>	ED 0>	11	<10	V	v	₹	< 0.02
Xylenes (Total)	0.004-0.06	0.04-0.6		<0.04-<0.08	19:D>	r9a>	90:0>	78%	<2 ^c	8	SV V	6	<0.04
HVOC 8010													
Trichloroethane	0.002-0.003	0.02-0.03		<0.03-<0.04	€0.037	P 0:03 ?	PE0.0>	0.73	ΝA	- <1	7		<0.02J
VOC 8260	0.020	0.100		<0.030-<0.150	Ϋ́	NA	<0.100	AN.	· ·		<1-12	₹	<0.020
SVOC 8270	0.200	2.20		<6.9-<15.0	Ϋ́	NA	<2.20	N.	AN	<25	AN	<10	<0.010
Pesticides	0.002-0.05	0.02-0.5		<0.023-0.3J	AN A	NA	<0.02J-<0.5J	NA	NA	<0.2J-<10J	ΨN	NA	<0.02J-<0.5J
PCBs	0.01-0.02	0.1-0.2	10	40.1	<0.1	<0.1	<0.2	<0.1	NA	27	NA	<21	<0.1

CT&E Data. F&B Data.

Not analyzed. Result is an estimate.

The action levels for DRPH and RRPH are based on conversations with ADEC; final action levels have not yet been determined.

DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.

BTEX determined by 8260 method analysis. 04 MARCH 1996

TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY (CONTINUED)

VITADI 6	Installation: Point Lay Site: Garage (SS06)		Matrix: Soil Units: mg/kg													
-C\41								Environmental Samples	Samples				Field Blanks			
0000130	Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	2512-1	2S13	2814-4.5	2815-4	2S16-6 & 2S18-6 (Replicates)	: 2S18-6 :ates)	AB01	2EB03	2TB03	Lab Blanks	ks
1\T8L3-3	Laboratory Sample ID Numbers					4693-14	4693-15	4693-16	4693-17	4693-18	4693-19	4356-5	4692-17	4692-16	4356 4692	4693
	ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	тв/ка	mg/kg	mg/kg	mg/kg	μg/L	μg/L	µ9∕L	J/6rl	mg/kg
	ОЯРН	4.00	4.00	500g	<50°-<100°	2,900J ^d	18.5 ^e	220 ^f	14.4 ^e	9,0309	15,200 ^h	NA	NA	NA A	NA	< 4.00
	GRРH	0.400	0.400	100	<3.1 ⁰ .<4.1 ⁰	172	1.41	1.28	0.607	733	937	NA	NA	NA	NA	<0.400
	BTEX (8020/8020 Mod.)			10 Total BTEX	<0.13-<0.20	NA	<0.125	0.031	<0.10	8.628	7.322				:	
	Benzene	0.020	0.020	0.5	<0.02-<0.04	NA	<0.025	<0.020	<0.020	0.178	0.158	<1 ^c	<1 _C	<1 ^C	<1	<0.020
	Toluene	0.020	0.020		*005-200*	NA	< 0.025	<0.020	<0.020	1.56	0.856	<1 ^C	<1 ^c	<1 ^C	^	<0.020
	Ethylbenzene	0.020	0.020		<0.03-<0.04	NA	<0.025	<0.020	<0.020	2.15	2.57	<1 ^c	<1 _C	<10	۷-	<0.020
	Xylenes (Total)	0.040	0.040		<0.04<0.08	NA	<0.050	0.031	< 0.040	4.74	3.74	<2 ^c	<2 ^c	<2 ^C	<2	<0.040
3-43	VOC 8260	0.020	2.00		<0.030-<0.150	<2.00J	N A	NA	NA A	N	V A	۲	3.10	3.10	1.09	<0.020
2	SVOC 8270	0.200	2.20-2.79	8,000	<6.90-<15.0	<2.20-2.79U	NA	AN	N A	N A	N A	NA	NA	NA	NA	<0.200-2.31

CT&E Data. F&B Data.

F&B Data. Not analyzed.

Result is an estimate.

The action level for DRPH is based on conversations with ADEC; a final action level has not yet been determined. Compound is not present above the concentration listed.

DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC. The laboratory reported that 2,500 mg/kg of the EPH pattern in this sample was not consistent with a middle distillate fuel. BTEX determined by 8260 method analysis.

The laboratory reported that 55.8 mg/kg of the EPH pattern in this sample was not consistent with a middle distillate fuel. The laboratory reported that the EPH pattern in this sample was not consistent with a middle distillate fuel.

The laboratory reported that 4,630 mg/kg of the EPH pattern in this sample was not consistent with a middle distillate fuel. The laboratory reported that 6,530 mg/kg of the EPH pattern in this sample was not consistent with a middle distillate fuel.

TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY (CONTINUED)

Site:	Installation: Point Lay Site: Garage (SS06)	>	Matrix: Sediment Units: mg/kg	diment 'kg										
						Ü	Environmental Samples	d Samples			Field Blanks		3 2	Lab
ھَ	Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	SD01	SD02	SD03	SD04	AB01	EB02	TB02	DIB	Blanks
Labor	Laboratory Sample ID Numbers					470	472	474	476	4356-5	557/572 4356-2	569 4356-1	#3&4-82593 #5-82793	#5-82593 #1&2-82593
Ā	ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	μg/L	μg/L	μg/L	µg/L	mg/kg
DRPH		9	09	500ª	<50 ² -<100 ^b	10,400J ^b	-ce0₽	<60 ^b	1,570J ^b	NA	₂ 0001>	Ā	<1,000	<50
GRPH		0.1	-	100	<3,0-4,0	gF06	むっ	d(1>	93°F	N A	< 100. ¹⁰	<100. ¹⁰	<1007	\ \
RAPH	ВВРН (Approx.)	12	120	2,000 ^a	<100	c120	<120	×120	029	Z A	<2,000	N A	<2,000	<100
BTEX Mod.)	BTEX (8020/8020 Mod.)			10 Total BTEX	<0.13-<0.20	10.76J	<0.15	<0.15	87.1					
Benzene	ine	0.003	0.03	0.5	<0.02-<0.04	<0.03	£0.0>	80,0>	635	<1°	7			<0.02
Toluene	ne	0.003	0.03		<0.02-<0.04	0.18	<0.03	<0.03	60	۷1°	7	7	\ \	<0.02
ethylb -44	Ethylbenzene	0.003	0.03		<0.03-<0.04	2.5	<0.03	<0.03	+ ស	۷۱ ₆	٧	۶		<0.02
<u> </u>	Xylenes (Total)	900:0	90.0		<0.04<0.08	8.1J	90'0>	900>	76	<2°	7.5	SV V	<2	<0.04
Ş	HVOC 8010	0.003-0.005	0.03-0.05		<0.03-<0.04	780 o>	^0.03J	<0.03	<0.053	NA A	7	٧		<0.02J
PCBs		0.01-0.03	0.1-0.3	10	<0.1	<0.1	<0.1	<0.1	<0.3	AN	S,	N A	<2J	<0.1

CT&E Data.

F&B Data.

Not analyzed.

The action levels for DRPH and RRPH are based on conversations with ADEC; final action levels have not yet been determined.

DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.

BTEX determined by 8260 method analysis. Result is an estimate.

TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY (CONTINUED)

AY\TABLE:	Installation: Point Lay Site: Garage (SS06)		Matrix: Sediment Units: mg/kg	nent									
S\4100						En	Environmental Samples	səldı		Field Blanks			Lab
66120	Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	2SD05	2SD06	2SD07	ABO1	2EB03	2TB03		blanks
1\TDI 2.2	Laboratory Sample ID Numbers					4693-11	4693-12	4693-13	4356-1	4692-17	4692-16	4356 4692	4693
	ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	η/Gπ	μg/L	μg/L	πg/L	mg/kg
	рврн	4.00	4.00	500ª	<50 ^b -<100 ^b	10,300 ^d	4.61 ^d	5.19J ^d	X A	Z A	NA	Ϋ́ V	<4.00
	GRРH	0.400	0.400	100	<3,₽<4,₽	16.3	<0.500	3.64	Ϋ́	¥ X	A	A A	<0.400
	BTEX (8020/8020 Mod.)			10 Total BTEX	<0.13-<0.20	<2.5	<0.125	N A			:		
	Benzene	0.020	0.025-0.500	0.5	<0.02-<0.04	<0.500	<0.025	AN	۸1°	\ \ \	<16	₹	<0.020
	Toluene	0.020	0.025-0.500		<0.02-<0.04	<0.500	<0.025	A N	۸10	×1°	<1°	⊽	<0.020
3	Ethylbenzene	0.020	0.025-0.500		<0.03-<0.04	<0.500	<0.025	ΑN	۸ ۱ د	<1°	<1°		<0.020
-45	Xylenes (Total)	0.040	0.050-1.000		<0.04-<0.08		<0.050	N.	<2°	<2°	<2°	<2	<0.040
	VOC 8260												
	Benzene	0.020	0.020	0.5	<0.030-<0.150	¥.	A A	0.020J	٧	^	<u>۸</u>	⊽	<0.020
	Ethylbenzene	0.020	0.020		<0.030-<0.150	NA	A A	0.085J	⊽	٧		⊽	<0.020
	Isopropylbenzene	0.020	0.020		<0.030-<0.150	N	NA	0.022J	٧	٧	٧	⊽	<0.020
	p-Isopropyitoluene	0.020	0.020		<0.030-<0.150	NA	NA	0.021J				⊽	<0.020
	Naphthalene	0.020	0.020		<0.030-<0.150	NA	NA	0.092J	<1	NA	AN	Ÿ	<0.020

CT&E Data. □ **₩**₹¬⊃« ₽

Not analyzed. F&B Data.

Result is an estimate.

Compound is not present above the concentration listed.

The action level for DRPH are based on conversations with ADEC; A final action level HAS not yet been determined. DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC. BTEX determined by 8260 method analysis.

The laboratory reported that the EPH pattern in this sample was not consistent with a middle distillate fuel.

TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Site: Garage (SS06)		Matrix: Sediment Units: mg/kg	ent									
					Env	Environmental Samples	səldı	_	Field Blanks			Lab
Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	2SD05	2SD06	2SD07	AB01	2EB03	2TB03		Blanks
Laboratory Sample ID Numbers					4693-11	4693-12	4693-13	4356-1	4692-17	4692-16	4356 4692	4693
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	μg/L	μg/L	μg/L	πg/L	mg/kg
n-Propylbenzene	0.020	0.020		<0.030-<0.150	NA	NA	0.068J			₹	⊽	<0.020
Toluene	0.020	0.020		<0.030-<0.150	NA	NA	0.199J	∨		⊽		<0.020
1,2,4-Trimethylbenzene	0.020	0.020		<0.030-<0.150	NA	NA	0.287J				⊽	<0.020
1,3,5-Trimethylbenzene	0.020	0.020		<0.030-<0.150	NA	NA	0.203.1	.	⊽	٧	⊽	<0.020
Xylenes (Total)	0.040	0.040		<0.060-<0.300	NA	N A	0.451J	<2	<2	<2	۲ <u>۰</u>	<0.040
SVOC 8270	0.200	0.228		<6.9-<15.0	NA	NA	<0.228-2.88U	NA	A N	NA	ž	<0.200-2.31

CT&E Data.

Not analyzed.

Result is an estimate.

Compound is not present above the concentration listed.

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04 MARCH 1996

TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY (CONTINUED)

 [AY\1]				11							
ABLES	Installation: Point Lay Site: Garage (SS06)	>	Matrix: Units:	Soil mg/kg		METALS ANALYSES	LYSES				
5\410966					Bkgd. Range from 7		En	Environmental Samples	S	 Field Blank	Lab
1301\TP	Parameters	Detect. Limits	Quant. Limits	Action Levels	DEW Line Installations	803	808			 EB02	Blanks
L3-3	Laboratory Sample ID Numbers					4354-4	4354-5			4356-2	4356 4354
	ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg			μg/L	μg/L
	Aluminum	0.35	2		1,500-25,000	2,300	2,100			<100	<100
	Antimony	N/A	50-63		<7.8-<230	<63J	<50			<100	<100
	Arsenic	0.11	50-63		<4.9-8.5	<63	<50			<100	<100
	Barium	0.024	1		27-390	290	280			<50	<50
	Beryllium	N/A	25-32		<2.6-6.4	<32	<25			<50	<50
3-	Cadmium	0.33	25-32		<3.0-<36	<32	<25			<50	<50
47	Calcium	69'0	4		360-59,000	2,000	1,500			410	<200
	Chromium	0.066	1		<4.3-47	21	54			<50	<50
	Cobalt	N/A	5.0-6.3		<5.1-12	<6.3	<5.0			<100	<100
	Copper	0.045	25-32		<2.7-45	<32	<25			<50	<50
	Iron	09'0	2		5,400-35,000	14,000	20,000			< 100	<100
	Lead	0.13	2		<5.1-22	92	195			<100	<100
	Magnesium	96'0	4		360-7,400	1,300	1,200			<200	<200
	Manganese	0.025	-		25-290	160J	270			<50	<50
	Molybdenum	N/A	25-32		<2.5-<11	<32	<25			<50	<50
(Nickel	0.11	1		4.2-46	16	12			<50	<50
)4 N	Potassium	23	100		<300-2,200	430	410			<5,000	<5,000

CT&E Data.

NA Not analyzed.

J Result is an estimate.

TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Site: Garage (SS06)	Ŋ.	Matrix: Units:	Matrix: Soil Units: mg/kg		METALS ANALYSES	LYSES					
				Bkgd. Range from 7		Environr	Environmental Samples	ples	Field Blank	ž	Lab
Parameters	Detect. Limits	Quant. Limits	Action Levels	DEW Line Installations	S03	808			EB02		Blanks
Laboratory Sample ID Numbers					4354-4	4354-5			4356-2	2-5	4356 4354
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg			ă	μg/L	πg/L
Selenium	1.2	50-63		<7.8-<170	<63	<50			⊽	<100	<100
Silver	0.53	25-32		<3-<110	<32R	<25			V	<50	<50
Sodium	0.55	5		<160-680	250	81			9	370	<250
Thallium	0.011	0.27-0.31		<0.2-<1.2	<0.31	<0.27				<5	<5 5
Vanadium	0.036	1		6.3-59	13	12			<u> </u>	<50	<50
Zinc	0.16	-		9.2-95	85	59			V	<50	<50

CT&E Data. Not analyzed. Result has been rejected.

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TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY (CONTINUED)

AY\TABLES	Installation: Point Lay Site: Garage (SS06)		Matrix: Surfu Units: #g/L	Surface Water ug/L									
!					i		Environmental Samples	tal Samples		4	Field Blanks		Lab
	Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	SW01 Qupl	SW01 & SW03 (Duplicates)	SW02	SW04	AB01	EB02	TB02	Blanks
3100	Laboratory Sample ID Numbers					501	500/626	567/622 4356-12 4354-10 4358-5	499/616	4356-5	557/572 4356-2	569 4356-1	#5-82793 #3&4-82593 4354 4356 4356
	ANALYSES	μg/L	J/6#	μg/L	μg/L	μg/L	μg/L	μg/L	η/6π	μg/L	η/Bπ	μg/L	μg/L
	DRPH	100	1,000		<1,000 ⁶	<1,000 ⁵	<1,000 ^b	ح1,000 ^{اه}	<1,000°	NA	₉ 000't>	NA	<1,000
	с В В	10	100		<50.1 ^b	<100.1 ^b	<100J ^b	<100J ^b	<1001 ^b	NA	<1001°	<100JP	<1007
	RRPH (Approx.)	200	2,000		<2,000	<2,000	<2,000	<2,000	<2,000	NA	<2,000	NA	<2,000
	BTEX (8020/8020 Mod.)												
-49	Benzene	0.1	-	ស	⊽	⊽	7	**	<1	<10	K-1	;×	<1
	Toluene	0.1	-	1,000	7	V	-	*	<1	<1°	<1	<1	<1
	Ethylbenzene	0.1	-	200	7	٧	7	₽>	*>	<1°	ī	12	<1
	Xylenes (Total)	0.2	23	10,000	8	Çi Çi	\ \ \	8	83 >	<2°	82	82	<2
	HVOC 8010	0.1	-		⊽	7	AN	Ÿ	N	NA	⊽	7	<1
	VOC 8260												
	Naphthalene	-	-		7	NA A	A A	2.1	Ą	⊽	⊽	٧	~
- •	1,3,5- Trimethylbenzene	-	-		<u>~</u>	N	N	1.2	N	⊽		7	^
	SVOC 8270	10	10		<20-<31	NA	NA	<10	NA	NA	<25	NA	<10

CT&E Data.

F&B Data.

Not analyzed.

Result is an estimate.
DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.
BTEX determined by 8260 method analysis.

TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Site: Garage (SS06)	>	Matrix: Units:	x: Surface Water : μg/L	Vater	METALS ANA	METALS ANALYSES: TOTAL (DISSOLVED)	ED)			
1 6	100	t		Bkgd. Range		Environmental Sample	tal Sample		Field Blank	Lab Blanks
rarameters	Limits	Limits	Levels	DEW Line Installations	SW02				EB02	
Laboratory Sample ID Numbers					4356-12 4354-10 4358-5				4356-2	4354 4356 4358
ANALYSES	μg/L	μg/L	η/βπ	η/bπ	η/Bπ				πg/L	μg/L
Aluminum	17.4	100		<100-350 (<100-340)	<100 (<100)				< 100 (< 100)	<100 (<100)
Antimony	A/Z	100	9	<100 (<100)	<100 (<100)				<100 (<100)	<100 (<100)
Arsenic	5.3	100	50	<100 (<100)	<100 (<100)				<100 (<100)	<100 (<100)
Barium	1.2	50	2,000	<50-93 (<50-91)	360 (340)				<50 (<50)	<50 (<50)
Beryllium	N/A	20	4	<50) (<50)	<50 (<50)				<50 (<50)	<50 (<50)
Cadmium	1.7	20	2	<50) <50)	<50 (<50)				<50 (<50)	<50 (<50)
Calcium	34.5	200		4,500-88,000 (4,100-86,000)	52,000 (51,000)				410 (<200)	<200 (<200)
Chromium	3.29	20	100	<50) (<50)	<50 (<50)				<50 (<50)	<50 (<50)
Cobalt	N/A	100		<100 (<100)	<100 (<100)				<100 (<100)	<pre>< 100 (< 100)</pre>
Copper	2.3	50	1,300	<50) (<50)	<50 (<50)				<50 (<50)	<50 (<50)
Iron	55	100		180-2,800 (<100-1,600)	5,600 (880)				<100 (<100)	<100 (<100)

3-50

CT&E Data. Not available. □≸

TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Site: Garage (SS06)	nt Lay S06)	Matrix: Units:	: Surface Water μg/L	Vater	METALS AN	METALS ANALYSES: TOTAL (DISSOLVED)		
۵		t e	Action	Bkgd. Range		Environmental Sample	Field Blank	Lab Blanks
61301\T	Limits	Limits	Levels	DEW Line Installations	SW02		EB02	
Laboratory Sample ID Numbers	ele				4356-12 4354-10 4358-5		4356-2	4354 4356 4358
ANALYSES	μg/L	η/Bπ	πg/L	πg/L	7/6#		ηg/L	πg/L
Lead	9.9	100	15	<100 (<100)	<100 (<100)		<100 (<100)	<100 (<100)
Magnesium	47.8	200		<5,000-53,000 (2,600-54,000)	26,000 (26,000)		<200 (<200)	<200 (<200)
Manganese	1.24	95		<50-510 (<50-120)	1,700		<50 (<50)	<50 (<50)
Wolybdenum	N/A	90		<50 (<50)	<50 (<50)		<50 (<50)	<50 (<50)
Nickel	5.5	20	100	<50 (<50)	<50 (<50)		<50 (<50)	<50 (<50)
Potassium	1,154	5,000		<5,000 (<5,000)	<5,000 (<5,000)		<5,000 (<5,000)	<5,000 (<5,000)
Selenium	62.4	100	50	<100 (<100)	<100 (<100)		<100 (<100)	<100 (<100)
Silver	2.6	90	50	<50) (<50)	<50) (<50)		<50 (<50)	<50 (<50)
Sodium	27.72	250		8,400-410,000 (8,200-450,000)	45,000 (44,000)		370 (400)	<250 (<250)
Thallium	0.57	Ŋ	2	<5 (<5)	<5) (<5)		<5 (<5)	 <5 (<5)

☐ CT&E Data.

N/A Not available.

J Result is an estimate.

04 MARCH 1996

TABLE 3-3. GARAGE ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Site: Garage (SS06)		Matri: Units	Matrix: Surface Water Units: μg/L	Vater	METALS ANALYSES: TOTAL (DISSOLVED)	YSES: TOTAL (DISSO	LVED)			
Daramotore	Datect	Quant	Action	Bkgd. Range		Environm	Environmental Sample		Field Blank	Lab Blanks
	Limits	Limits	Levels	DEW Line Installations	SW02				EB02	
Laboratory Sample ID Numbers					4356-12 4354-10 4358-5				4356-2	4354 4356 4358
ANALYSES	μg/L	πg/L	η/6π	η/6π	μg/L				μg/L	μg/L
Vanadium	1.8	50		<50 (<50)	<50 (<50)				<50 (<50)	< 50 (< 50)
Zinc	8.2	50		<50-160 (<50)	<61 (<50)				<50 (<50)	<50 (<50)

TABLE 3-4. IDENTIFICATION OF CHEMICALS OF CONCERN AT THE GARAGE (SS06)

10.10	CHEMICAL OF CONCERN	Yes	Yes	Yes	ON.	ON.	N _o	ON.		Yes*	Yes*	No	No	Yes*	Yes	Yes	No	Yes*	Yes*	ON	No	No	ON	No	No	No.
	ARAR	500°	100°	2,000°	0.5°		I	;		:	į	₉ 06	1	;	1	54	1	!	1	;	:	1	:	1	500°	ı
RBSL ^a	NON-CANCER	-	**	ŧ		5,400	2,700	54,000		1	1	1,620	1,100	t	270	110	1	1	***	1	1,890	•	135	1	ţ	1
H.	CANCER	1	I	ı	2.2	ı	î	1		1	1	8.53	1	-	1.23	1.1	5.8	1	1	-	1	:	-	:		1
	BACKGHOUND RANGE	<50-<100	<3J-<4J	<100	<0.02-<0.04	<0.02-<0.04	<0.03-<0.04	<0.04-<0.08		<0.030-<0.150	<0.030-<0.150	<0.030-<0.150	<0.030-<0.150	<0.030-<0.150	<0.03-<0.04	<0.03-<0.04	<0.03-<0.04	<0.030-<0.150	<0.030-<0.150	1,500-25,000	27-390	360-59,000	<4.3-47	5,400-35,000	<5.1-22	360-7,400
	UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
	MAXIMUM	33,400J	937	40,000	0.3J	4	14	42J		0.022J	0.042J	0.023BJ	0.158J	0.068J	43J	1.8J	23	0.315J	0.497J	2,300	290	2,000	54	20,000	195	1,300
	CHEMICAL DETECTED	ОЯРН	GRPH	RRPH	Benzene	Toluene	Ethylbenzene	Xylenes (Total)	cis-1,2-Dichloroethene	Isopropylbenzene	p-isopropyltoluene	Methylene Chloride	Naphthalene	n-Propylbenzene	Tetrachloroethene	Trichloroethane,1,1,2-	Trichloroethene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Aluminum	Barium	Calcium	Chromium	Iron	Lead	Magnesium
	MATRIX	Soil/Sediment																								
	SITE	Garage	(9088)																							

TABLE 3-4. IDENTIFICATION OF CHEMICALS OF CONCERN AT THE GARAGE (SS06) (CONTINUED)

						Œ	RBSL ^a		
SITE	MATRIX	CHEMICAL DETECTED	MAXIMUM CONCENTRATION	UNITS	BACKGROUND RANGE	CANCER	NON-CANCER	ARAR	CHEMICAL OF CONCERN
Garage	Soil/Sediment	Manganese	270	mg/kg	25-290	_	3,780	1	°N
(9088)	(Continued)	Nickel	16	mg/kg	4.2-46	1	540	1	ON.
(Continued)		Potassium	430	mg/kg	<300-2,200		:	:	°N
		Sodium	250	mg/kg	<160-680	ŀ	ı		o N
		Vanadium	13	mg/kg	6.3-59	#	189	ı	o _N
		Zinc	85	mg/kg	9.2-95	1	8,100	1	o Z
	Surface Water ⁹	Naphthalene	2.1	Hg/L	<1	-	150	1	ON.
		1,3,5-Trimethylbenzene	1.2	µg/L	<1		1	:	Yes*
		Barium	360	η/Bπ	<50-93	1	256	2,000	Yes
		Calcium	52,000	η/Bπ	4,100-88,000	•	•	1	No
		Iron	2,600	μg/L	<100-28,000	*	1	-	o _N
		Magnesium	26,000	T/6#	<5,000-54,000	1	:	1	°N
		Manganese	1,700	7/B#	<50-510		18.3	ī	Yes
		Sodium	45,000	πg/L	8,200-450,000	-	1	1	No

The COCs selected for the site do not include metals that are considered essential human nutrients or analytes that do not have an RBSL or ARAR; however, these chemicals were discussed in the Point Lay Risk Assessment (U.S. Air Force 1996).

Risk-Based Screening Level.

Applicable or Relevant and Appropriate Requirement. ADEC 1991. 57 FR 31776 (17 July 1992).

EPA 1991c.

MCL, 56 FR 30266 (01 January 1991).

The concentrations reported for metals in surface water are total metals.

The analyte was detected in the associated blank.

Result is an estimate.

3.3 DRAINAGE PATHWAY FROM POL TANKS (\$\$07)

3.3.1 Site Background

The Drainage Pathway from POL Tanks (SS07) is located along the bluff between the fuel storage area and the Kasegaluk Lagoon. The site consists of three small streams and a beach bluff located at the edge of the gravel pad. The gravel pad area was historically a drum storage area. An ADEC representative who inspected this site during the reconnaissance visit felt this area appeared potentially contaminated. Styrofoam and fabric debris are partially buried in some areas along the bluff at this site.

The site-specific environmental setting describing the topography, surface water drainage, and soil types is presented in the discussion of potential migration pathways, Section 3.3.3.

3.3.2 Field Sampling and Analytical Results

This section describes the RI sampling and analytical results for samples collected at the Drainage Pathway from POL Tanks (SS07) site. The discussion presents a review of laboratory data, data summary tables, contaminants identified, contaminant trends, and information on suspected source areas.

3.3.2.1 Summary of Samples Collected. A total of 13 samples was collected at the site. These consisted of seven sediment and five surface water samples. Table 2-2 presents a detailed summary of the samples collected and the analyses performed during the 1993 RI field activities. Locations of all samples collected at the Drainage Pathway from POL Tanks (SS07) site are presented in Figure 3-3.

Seven sediment samples were analyzed for DRPH and GRPH. In addition, four samples were analyzed for RRPH, BTEX, and VOCs. One sample was analyzed for pesticides.

Six surface water samples were analyzed for DRPH and GRPH. In addition, four samples were analyzed for VOCs, three samples were analyzed for RRPH, HVOCs, and BTEX. One sample was analyzed for SVOCs, TDS, TSS, and TOC.

3.3.2.2 Analytical Results. The data summary table (Table 3-6) presents analytical results for all samples collected at the site. Detection and quantitation limits, action levels, associated laboratory and field blanks, and background analytical results are presented for each of the analyses. Background levels are listed to allow direct comparison of naturally occurring organic compounds with samples collected from the site. Sample locations and analytical results for the samples at the site are illustrated in Figure 3-3. All organic compounds detected are presented on the figure except when they were a result of laboratory contamination or field decontamination procedures. The exceptions are presented on the data summary table.

The following section presents a discussion of organic compounds detected above background levels at the site. A discussion of TDS, TSS, and TOC is included.

Organics. Organic compounds detected in soil and sediment samples collected at the site include DRPH, GRPH, BTEX compounds, and one other VOC. DRPH were detected in three samples ranging from 10.8 to 27.7 mg/kg; it was reported by the laboratory that the chromatograph patterns for environmental petroleum hydrocarbons in these samples were not consistent with those for a middle distillate fuel. GRPH were detected in one sediment sample, SS07-SD04, at 3 mg/kg. BTEX compounds were detected at very low concentrations in two samples. Total BTEX was detected at 0.71 and 0.032 mg/kg; xylenes were the primary component. One other VOC, naphthalene, was detected at very low concentrations in sediment sample SS07-2SD05; naphthalene is a common component of diesel fuel.

In the surface water sample, organic compounds detected include DRPH, GRPH, benzene, ethylbenzene, xylenes, and six other VOCs. DRPH were detected in two surface water samples at 961 and 260 μ g/L (SS07-2SW04 and SS07-2SW06, respectively); however, the laboratory reported that the chromatograph patterns for environmental petroleum hydrocarbons in these samples were not consistent with those for a middle distillate fuel. GRPH were detected at 189 μ g/L in surface water sample SS07-2SW06. Benzene was detected at 1.7 μ g/L in surface water sample SS07-2SW04. Ethylbenzene and xylenes were detected at low levels (5 and 12 μ g/L, respectively) in surface water sample SS07-SW01. Six other VOCs were detected in the four surface water samples. The six VOCs detected were tetrachloroethene (2 μ g/L), trichloroethene (3.9 to 133 μ g/L), dichloroethene (2.3 μ g/L), cis-1,2,-dichloroethene (7.5 to 178 μ g/L), trans-1,2-dichloroethene (2.1 to 3.6 μ g/L), and trichlorobenzene (1.3 μ g/L).

Inorganics. Metals were not a concern at the site, and no metals analyses were performed. TOC, TSS, and TDS were reported in surface water sample SS07-SW02 at 15,500, 28,000, and 1,976,000 μ g/L, respectively.

3.3.2.3 Summary of Site Contamination. DRPH detected at the site are probably of biogenic origin; the DRPH detected in both the soil/sediment and surface water samples were reported to have chromatograph patterns that were not consistent with patterns for a middle distillate fuel. GRPH detected are probably related to solvent contamination. The source of these solvents in water is suspected to be related to the repainting of the POL tanks approximately two weeks prior to sample collection, but may also be attributable to a drum storage area that was formerly located on the gravel pad. Because these compounds were detected in flowing surface water, no estimate of the volume of contamination was made.

3.3.3 Migration Pathways

This section describes the topography and stratigraphy of the site and the migration potential of contaminants from the site. A discussion of receptors and chemical concentrations at receptors is included.

3.3.3.1 Topography and Stratigraphy. The beach bluff at the site is approximately 10 feet high and separates the relatively flat tundra area at the installation from the lagoon; between the foot of the beach bluff and the lagoon is a sandy beach. The bluff is incised by three small streams fed by springs at the top of the bluff. These streams infiltrate into the sandy beach at the foot of the bluff.

During the 1993 RI, permafrost was located at a depth of approximately two feet thick in tundra areas and four feet under gravel pads. Gravel pads consisted of the typical gravels and sands associated with these features, and subsurface tundra materials were of the typical stratigraphy associated with the Point Lay area (Section 2.4.4.2). Along the beach subsurface materials consisted of the typical sands, gravels, and fine materials associated with these features.

3.3.3.2 Migration Potential.

Subsurface Migration. The small streams at the site are fed by active layer water springs; the water in these features has a subsurface origin near the top of the bluff. The presence of organic contaminants in surface water samples from these streams indicates that the subsurface water feeding the streams is potentially contaminated. The source of these analytes has not been identified, but it is probably in the gravel area above the bluff and/or upgradient of the gravel area in the POL tank area. Based upon these considerations, the subsurface migration potential for this site is considered to be high.

Surface Migration. Analytical results indicate the streams at the site have been contaminated with low levels of organic compounds. Because these streams drain to the vicinity of the lagoon, the surface migration potential at the site is considered to be high.

Air Transport. Air transportation is not considered to be a significant mode of migration at the site (Section 2.4.4.5).

Summary of Migration Potential. The occurrence of organic contaminants in active layer springfed streams indicates that subsurface migration has probably occurred in the gravel pad area above the beach bluff. The streams in which the analytes were detected drain to the immediate vicinity of Kasegaluk Lagoon, providing a pathway for contaminated surface water to enter the lagoon. The migration potential for both surface and subsurface water at the site is considered to be high.

3.3.3.3 Receptors and Chemical Concentrations at Receptors.

Human Receptors. Potential human receptors at the Drainage Pathway from POL Tanks site include Air Force contractor personnel working at the station, visitors to the station, and an occasional local visitor passing the site to get to recreational or subsistence lands. Human receptors could potentially be exposed to the chemicals detected in surface water and soil/sediments at the site. The primary routes of potential exposures at the site are direct contact with soil/sediment, incidental ingestion of soil/sediment, and ingestion of surface water. Because ground water and air at the Point Lay sites are not considered complete pathways of exposure, these media are not evaluated as potential pathways to human receptors.

The Point Lay Risk Assessment (U.S. Air Force 1996) evaluates in detail the risks to human health from all COCs detected at the site. The potential receptor groups were selected based on their likelihood of exposure to contaminants at the site and include DEW Line workers at the installation, and native adults and children who may visit the site. The estimated exposure point concentrations for human receptors are based on the maximum concentration of each chemical

detected at the site. The potential risks to human health associated with chemicals at the site are presented in Section 3.3.4.

Ecological Receptors. Ecological receptors were evaluated in detail in the Point Lay Risk Assessment (U.S. Air Force 1996) to determine if plants and animals could potentially be impacted by the chemicals detected at the Point Lay installation. Because of the diversity of the plants and animals in the area of the Point Lay installation, a set of representative species was selected in the ERA for detailed evaluation. The species include plants, aquatic invertebrates, fish, birds, and mammals. These receptors were selected based on the species' likelihood of exposure given their preferred habitat and feeding habits. The representative species encompass a range of ecological niches in order to achieve the best characterization of the ecosystems being examined and are presented in Table 2-6.

The estimate of chemical concentrations at the ecological receptors was based on the average site-wide concentration of each COC. This approach was appropriate because few of the representative species would inhabit only one distinct site at the installation; they are more likely to be exposed to the mix of chemicals and concentrations detected on all the sites at Point Lay. The potential ecological risks associated with the chemicals detected at the site are presented in Section 3.3.5.

3.3.4 Human Health Risk Assessment

This section presents a summary of the potential human health risks associated with the chemicals detected at the Drainage Pathways from POL Tanks (SS07) site. The purpose of the human health risk assessment is to quantify the excess lifetime cancer risk and/or the noncancer hazard (reported as hazard index) from the contaminants detected at the site.

This summary presents the COCs at the site, the pathways by which human receptors may be exposed to site chemicals, potential risks to human health posed by each chemical through each exposure pathway, the significance of the risk and/or hazard estimate, and a comparison of site chemical concentrations to ARARs. The methods and assumptions used in calculating hazards and risks are presented in Section 2.4.1.

3.3.4.1 Chemicals of Concern. At the Drainage Pathway from POL Tanks (SS07), no COCs were identified for the soil matrix at the Drainage Pathway from POL Tanks site based on a comparison of the maximum concentrations of detected chemicals to their background, RBSL, or ARAR concentrations.

DRPH, GRPH, benzene, tetrachloroethene, trichloroethene, 1,1-dichloroethene, and cis-1,2-dichloroethene were identified as COCs for the surface water at the Drainage Pathway from POL Tanks site. DRPH and cis-1,2-dichloroethene exceeded their RBSLs based on noncancer hazard; cis-1,2-dichloroethene also exceeded an ARAR which is an MCL promulgated under the federal Safe Drinking Water Act. Benzene, tetrachloroethene, and 1,1-dichloroethene exceeded their RBSLs based on cancer risk, and trichloroethene exceeded an ARAR which is an MCL promulgated under the federal Safe Drinking Water Act.

Table 3-6, Identification of COCs at the Drainage Pathway from POL Tanks, presents the maximum concentrations of chemicals detected at the site, the associated background concentrations, RBSLs, and ARARs, and identifies COCs selected in the risk evaluation.

3.3.4.2 Exposure Pathways and Potential Receptors. Because no COCs were identified for soil/sediment at the site, only surface water ingestion pathways were evaluated in the risk assessment.

Three potential receptor groups were evaluated in the risk assessment: an adult assigned to a DEW Line installation (worker), an adult inhabitant of communities in the North Slope of Alaska (native), and a child living in a North Slope community (child).

3.3.4.3 Risk Characterization.

Noncancer Hazard and Cancer Risk Associated with Soils and Sediments. No COCs were selected for the soil at the Drainage Pathway from POL Tanks site. This does not indicate that exposure to chemicals in the soil at this site is without health risk; however, the concentrations measured were less than the concentrations considered acceptable under Region 10 guidance (EPA 1991a) or federal ARARs.

Noncancer Hazard and Cancer Risk Associated with Surface Water. The noncancer hazard associated with the ingestion of surface water at the Drainage Pathway from POL Tanks site by a hypothetical native northern adult or by a DEW Line worker is 0.4, based on the maximum concentrations of the COCs. DRPH, GRPH, tetrachloroethene, 1,1-dichloroethene, and cis-1,2-dichloroethene account for the quantifiable noncancer hazard for these receptor/pathway combinations. DRPH and cis-1,2-dichloroethene together account for more than 90 percent of the noncancer hazard.

The excess lifetime cancer risk associated with the ingestion of surface water at this site by native northern adults is 4×10^{-5} , and by DEW Line workers is 7×10^{-6} , based on the maximum concentrations of the COC. The presence of GRPH, benzene, tetrachloroethene, trichloroethene, and 1,1-dichloroethene accounts for the quantifiable excess lifetime cancer risk for these receptor/pathway combinations.

Summary of Human Health Risk Assessment. The potential risks and hazards associated with the surface water at the Drainage Pathway from POL Tanks are the very low noncancer hazard (hazard index of 0.4), and very low cancer risk associated with the GRPH, benzene, tetrachloroethene, trichloroethene, and 1,1-dichloroethene. Remedial action is generally not warranted at sites where the excess lifetime cancer risk is less than 1 x 10⁻⁴ or the noncancer hazards do not significantly exceed one (EPA 1991b), and on the basis of the risk assessment remediation of the site is not warranted.

The potential risks and hazards were calculated assuming the affected surface water would be used as a sole-source water supply for 180 days per year. Based on site-specific information, the chemicals in surface water do not currently pose a health hazard nor are they likely to pose a hazard in the future. The surface water expressions at the site are frozen most of the year;

many are only intermittently filled with water during the summer months. The surface water at the site is not known to be used as a water supply now, nor has it been used in the past. In conclusion, under current uses the COCs identified in surface water at the Drainage Pathway from POL Tanks site pose only a minimal, if any, potential threat to human health. In the unlikely event that surface water at the site is used as a sole-source drinking water supply in the future, a potential noncancer hazard to human health could exist if conditions remain constant.

In conclusion, the COCs identified in surface water at the Drainage Pathway from POL Tanks site pose only a minimal, if any, potential threat to human health. Based on the human health risk assessment, remedial actions are not warranted at the site.

3.3.5 Ecological Risk Assessment

The objective of the ERA is to estimate the potential impacts of chemicals detected at the installation on aquatic and terrestrial plants and animals. A summary of the methods used to assess potential ecological impacts is presented in Section 2.4.2.

- 3.3.5.1 Chemicals of Concern. COCs were selected based on criteria presented in Section 3.1 of the ERA. The average installation-wide concentration of COCs were used to calculate risk estimates. All sites at the installation were considered to be potentially usable habitat. The COC selection process only considered the soil/sediment samples that were at or less than 1.5 feet deep. The soil/sediment samples were screened for depth because it is unlikely that any of the representative species will be exposed to soil/sediments deeper than 1.5 feet. Iron, manganese, and DRPH were identified as COCs in surface water, and the COCs in soils/sediments at the site were DRPH, GRPH, and BTEX. None of the identified COCs was associated with significant risk estimates at the Drainage Pathway from POL Tanks site.
- **3.3.5.2** Summary of Ecological Risk Assessment. Based on the quantification of potential risks to ecological receptors and discussions presented in the Point Lay ERA, ecological risks at the Drainage Pathway from POL Tanks site are minimal.

3.3.6 Conclusions and Recommendations

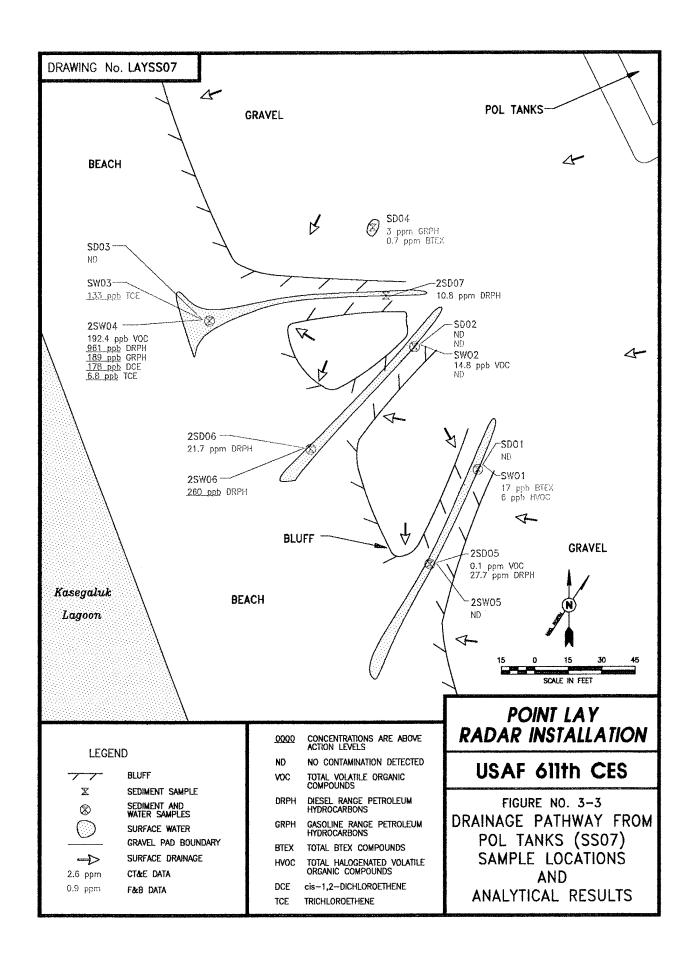
Sampling and analyses have determined that the Drainage Pathway from POL Tanks (SS07) site is contaminated with solvents and petroleum hydrocarbons (GRPH). The affected area at the site is the surface water along the bluff and at the base of the bluff. The suspected source of contamination is suspected to be related to the repainting of the POL tanks approximately two weeks prior to sample collection, but may also be attributable to a drum storage area that was formerly located on the gravel pad. Because the contaminants were detected in flowing surface water, no estimate of the volume of contamination was made.

The risk assessment concluded that risks posed to human health and ecological receptors by site contaminants are minimal given current and future site uses. The potential human health risks at the site are not of a magnitude that normally requires remedial action. The ERA concluded that the overall potential risks presented by site contaminants are minimal. Therefore,

considering the findings of the risk assessment, remediation of the site is not necessarily warranted.

Levels of solvents detected in surface water at the site exceed ADEC guidance cleanup levels and have migrated downgradient of the site. Therefore, the site is being recommended for remedial action. The affected area at the site is surface water at the beach bluff and the base of the bluff adjacent to Kasegaluk Lagoon. The remedial action alternative recommended for the site is monitoring. If contaminants continue to be detected at the site, then further investigation may be warranted. A complete description and evaluation of the remedial alternatives considered for this site are presented in the FS, Section 4.0.

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TABLE 3-5. DRAINAGE PATHWAY FROM POL TANKS ANALYTICAL DATA SUMMARY

CT&E Data. F&B Data.

The action levels for DRPH and RRPH are based on conversations with ADEC; final action levels have not yet been determined.

DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.

Total BTEX determined by 8260 method analysis. Not analyzed. Result is an estimate.

TABLE 3-5. DRAINAGE PATHWAY FROM POL TANKS ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Site: Drainage Pathway from POL Tanks (SS07) Units: mg/kg	from POL 1	Mat anks (SS07) Unit	Matrix: Sediment Units: mg/kg	Ţ.								
						Environmental Samples	ıl Samples		Field Blanks		; تـ	Lab
Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	2SD05	2SD06	2SD07	AB01	2EB03	2TB03	Bla	ınks
Laboratory Sample ID Numbers					4692-6	4692-7	4692-8	4356-5	4692-17	4692-16	4356 4692	4692
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	μg/L	η/6π	μg/L	μg/L	mg/kg
рярн	4.00	4.00	500ª	<50 ^b -<100 ^b	27.7J ^d	21.7 ^e	10.8 ^e	NA	NA	Y Y	Y.	<4.00
GRРH	0.400	0.500-0.600	100	<3J ^b -<4J ^b	<0.600	<0.500	<0.600	NA	NA	NA	NA	<0.400
VOC 8260												
Naphthalene	0.020	0.025-0.030		<0.030-<0.150	0.030J	<0.025	<0.030	▼	Ą	AN	⊽	∇
Xylenes (Total)	0.040	0.050-0.060		<0.060-<0.300	0.032J ^c	<0.050	<0.060	<2	<2	<2	<2	<2

DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC. The action level for DRPH is based on consversations with ADEC; a final action level has not yet been determined. Result is an estimate.

The laboratory reported that 10.3 mg/kg of the EPH pattern in this sample was not consistent with a middle distillate fuel. The laboratory reported that the EPH pattern in this sample was not consistent with a middle distillate fuel. Result is indicative of p & m-xylenes only.

Not analyzed.

CT&E Data. F&B Data.

TABLE 3-5. DRAINAGE PATHWAY FROM POL TANKS ANALYTICAL DATA SUMMARY (CONTINUED)

L	Installation: Point Lay Site: Drainage Pathway from POL Tanks (SS07) Units:	from POL T	anks (SS07)		Surface Water μg/L								
					i		Environ	Environmental Samples			Field Blanks		Lab
	Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	SW01	SW02	SW03		AB01	EB02	TB02	Blanks
1\TBL3-5	Laboratory Sample ID Numbers					558/582	584/586 4356-7	588/289		4356-5	557/572 4356-2	569 4356-1	#5-82793 #3&4-82593 4356
<u> </u>	ANALYSES	μg/L	µg/L	μg/L	η/Bπ	η/Bπ	T/6#	μg/L		ηg/L	η'βπ	μg/L	μg/L
	рярн	100	1,000		<1,000 ²	<1,000 ^b	<1,000 ^b	<1,000°		NA	<1,000	N A	<1,000
<u></u>	GRPH	10	100		dCoe>	ح1001 ⁵	<1001b	<100J ^b		NA	<100J ^b	<100.Jb	<1007
	ЯВРН (Арргох.)	200	2,000		<2,000	<2,000	<2,000	<2,000		NA	<2,000	NA	<2,000
	BTEX (8020/8020 Mod.)												
<u> </u>	Benzene	0.1	1	5		٧	٧	⊽		<1°	٧	V	
3-6	Toluene	0.1	-	1,000	1>	-5		7		۲۰ ۱۰	V	V	∨
<u> </u>	Ethylbenzene	0.1	-	700	<1	73	<1	2		^ 1°	V	Ÿ	~
<u> </u>	Xylenes (Total)	0.2	2	10,000	8	12	8	25		<2°	42	S.Y	<2
	HVOC 8010												
	Tetrachloroethene	0.1	-	5	V	ત	Ÿ	٧		NA	⊽	V	<1
	Trichloroethene	0.1	-	5	7	4	⊽	133		N A	7		
	VOC 8260								- -		-		
	cis-1,2-Dichloroethene	1	1	70	<1	NA	7.5	NA		^	\ 1	^	<1
j													

CT&E Data.

F&B Data.

Not analyzed.

Result is an estimate.

DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.

BTEX determined by 8260 method analysis.

TABLE 3-5. DRAINAGE PATHWAY FROM POL TANKS ANALYTICAL DATA SUMMARY (CONTINUED)

Matrix: Sur Installation: Point Lay Site: Daniage Pathway from POL Tanks (SS07) Units: μg/L	from POL T	anks (SS07)	Matrix: Su Units: μg/l	Matrix: Surface Water Units: μg/L									
						Environ	Environmental Samples	səlc		F	Field Blanks		Lab
Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	SW01	SW02	SW03		AB01	101	EB02	TB02	Blanks
Laboratory Sample ID Numbers					558/582	584/586 4356-7	588/589		43	4356-5	557/572 4356-2	569 4356-1	4356
ANALYSES	η/βπ	η/Ĝπ	μg/L	μg/L	#g/L	μg/L	#B/L			πg/L	µg/L	πg/L	πg/L
trans-1,2- Dichloroethene	-	1	100	^	NA	2.1	Υ Υ			⊽	∇		<u>^</u>
1,2,3-Trichlorobenzene	-	1		<1	N A	1.3	A N			⊽			₹
Trichloroethene	1	1	5	<u> </u>	NA	3.9	NA			⊽	⊽	~	
SVOC 8270	10	19		<20-<31	NA	<19	Å			¥	<25	AN A	<10
T0C	5,000	5,000		31,700-40,000	A A	15,500	N A			¥.	A N	AN	NA
TSS	100	200		6,000-77,000	NA	28,000	NA			A A	A A	AN N	<200
TDS	10,000	10,000		149,000-151,000	NA	1,976,000	NA			¥	A A	NA A	<10,000

CT&E Data. Not analyzed.

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04 MARCH 1996

TABLE 3-5. DRAINAGE PATHWAY FROM POL TANKS ANALYTICAL DATA SUMMARY (CONTINUED)

 AY\T.					Motor.								
ABLE	installation: Point Lay Site: Drainage Pathway from POL Tanks (SS07) Units: μg/L	om POL Ta	nks (SS07)	inatitis: Sulface water Units: μg/L	lace Walei								
S\4109							Ш	nvironment	Environmental Samples	4	Field Blanks		Lab
966130	Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	2SW04	2SW05	2SW06		AB01	2EB03	2TB03	blanks
1\TBL3-5	Laboratory Sample ID Numbers					4692-1	4692-4	4692-5		4356-5	4692-17	4692-16	4356 4692
	ANALYSES	7/6#	η/bπ	μg/L	μg/L	μg/L	μg/L	μg/L		η'βη	μg/L	µg/L	μg/L
	DRPH	100	100-150		<1,000 ⁵	961 ^{ad}	<150	260 ^{ad}		NA	N A	NA	<100
	GRРH	20	20		<50J [‡]	189 ^a	<20	<20		A A	A.	N A	<20
	VOC 8260												
	Benzene	-	1	5	<1	1.7	×1	<u>۲</u>		٧		٧	
	Chloromethane	-			~	3.2B	2.6B	3.68		⊽	3.10	3.1U	1.09
	1,1-Dichloroethene	1	1	7	~	2.3	^	^		V	<u>^</u>	₹	
3-6	cis-1,2-Dichloroethene	1	1	70	^	178	^	^			4.6	1.5	
9	trans-1,2-Dichloroethene	1	1	100	<1	3.6	۲	٧				⊽	
	Trichloroethene	1	-	5	<1	6.8	<1	<1		<1	1.7		

CT&E Data. F&B Data.

Not analyzed.

The analyte was detected in the associated blank. Result is an estimate.

Compound is not present above the concentration listed.

Total petroleum hydrocarbons in these water samples exceed the 15 μg/L stated for fresh water in ADEC's Water Quality Criteria 18AAC70 (ADEC 1989).

DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC. The laboratory reported that the EPH pattern in this sample was not consistent with a middle distillate fuel.

TABLE 3-6. IDENTIFICATION OF CHEMICALS OF CONCERN AT THE DRAINAGE PATHWAY FROM POL TANKS (SS07)

Ц							В	RBSL ^a		TO A CITATION
	SITE	MATRIX	CHEMICAL DETECTED	MAXIMUM	UNITS	BACKGHOUND RANGE	CANCER	NON-CANCER	ARAR	CONCERN
·———	Drainage Pathway from POL Tanks	Sediment	рярн	L7.72	mg/kg	<50-<100	1	1	500°	ON N
	(8807)		Наво	31	mg/kg	<3-<4	1	I	100°	No
			Benzene	0.07	mg/kg	<0.02-<0.04	2.2	1	0.5°	No
			Toluene	0.04	mg/kg	<0.02-<0.04	t	5,400	1	No
			Ethylbenzene	0.2	mg/kg	<0.03-<0.04	1	2,700	1	No
			Xylenes (Total)	0.4J	mg/kg	<0.04-<0.08	1	54,000	1	No
			Naphthalene	0:0307	mg/kg	<0.04-<0.150	1	1,100	:	No
		Surface Water	DRPH	961	μg/L	<1,000	1	292	:	Yes
			Начэ	189	μg/L	<50	20	730	1	Yes
3-70			Benzene	1.7	μg/L	^	0.617	1	59	Yes
`			Ethylbenzene	5.1	μg/L		i	158	700°	No
			Xylenes (Total)	121	μ9/L	<2	1	7,300	10,000 ^e	No
			1,1-Dichloroethene	2.3	7/B#	<1	0.142	32.9	7م	Yes
			cis-1,2-Dichloroethene	178	μg/L	^	1	36.5	70°	Yes
			trans-1,2-Dichloroethene	3.6	μg/L	^	į .	73	100 ^e	No
			Tetrachloroethene	2	μg/L	<1	0.143	36.5	ညီ	Yes
			Trichloroethene	133	μg/L	^	0.25		5	Yes

Risk-Based Screening Level. Applicable or Relevant and Appropriate Requirement.

ADEC 1991.
MCL, 52 FR 25690.
MCL, 56 FR 3526 (30 January 1991).
The analyte was detected in the associated blank.
Result is an estimate.

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3.4 CRUSHED DRUM AREA (SS08)

3.4.1 Site Background

The Crushed Drum Area (SS08) site is a gravel pad located approximately 150 feet northeast of the module train. The gravel pad slopes gently to the tundra north and east of the site and is adjacent to a drainage pathway that runs from below the east end of the module train to the south end of the gravel pad area at the site. It was determined that an investigation was warranted at this site because of the previous drum-crushing activities.

The site-specific environmental setting describing the topography, surface water drainage, and soil types is presented in the discussion of potential migration pathways, Section 3.3.4.

3.4.2 Field Sampling and Analytical Results

This section describes the RI sampling and analytical results for samples collected at the Crushed Drum Area site. The discussion presents a review of laboratory data, data summary tables, contaminants identified, contaminant trends, and information on suspected source areas.

3.4.2.1 Summary of Samples Collected. A total of 16 samples was collected at the site. These consisted of 11 soil, 3 sediment, and 2 surface water samples. Table 2-2 presents a detailed summary of the samples collected and the analyses performed during the 1993 RI field activities. Locations of all samples collected at the Crushed Drum Area (SS08) site are presented in Figure 3-4.

The 11 soil samples were analyzed for DRPH and GRPH. In addition, nine samples were analyzed for BTEX. Six samples were analyzed for RRPH, HVOCs, and PCBs, and three samples were analyzed for VOCs. Two samples were analyzed for SVOCs, and one sample was analyzed for pesticides and total metals.

The three sediment samples were analyzed for DRPH, GRPH, RRPH, HVOCs, BTEX, and PCBs. In addition, one sample was analyzed for VOCs, SVOCs, and total metals.

Two surface water samples were analyzed for DRPH, GRPH, RRPH, BTEX, HVOCs, and PCBs. In addition, one sample was analyzed for VOCs, SVOCs, total and dissolved metals, TOC, TSS, and TDS.

3.4.2.2 Analytical Results. The data summary table (Table 3-7) presents analytical results for all samples collected at the site. Detection and quantitation limits, action levels, associated laboratory and field blanks, and background analytical results are presented for each of the analyses. Background levels are listed to allow direct comparison of naturally occurring organic compounds with samples collected from the site. Sample locations and analytical results for the samples at the site are illustrated in Figure 3-4. All organic compounds detected are presented on the figure except when they were a result of laboratory contamination or field decontamination procedures. Only metals detected above background levels that exceed an

RBSL or ARAR are presented on Figure 3-1. The exceptions are presented on the data summary table.

The following section presents a discussion of organic compounds and inorganic analytes detected above background levels at the site. A discussion of TDS, TSS, and TOC is included.

Organics. Organic compounds detected in soil and sediment samples collected at the site include DRPH, GRPH, RRPH, BTEX compounds, eight other VOCs, and seven SVOCs. DRPH were detected in eight samples ranging from 4.19 to 17,500 mg/kg. GRPH were detected in seven samples ranging from 1.97 to 2,430 mg/kg. BTEX compounds were also detected in five samples. Total BTEX ranged from 0.80 to 122.2 mg/kg; xylenes were the primary component. Eight other VOCs were detected in soil samples at concentrations ranging from 0.023 to 48 mg/kg. The VOCs include common components of diesel fuel and solvents. Seven SVOCs were detected in three soil/sediment samples at low levels ranging from 0.261 to 11.7 mg/kg; 2-methylnaphthalene was the primary component.

In the surface water sample, organic compounds detected include BTEX compounds and five other VOCs. BTEX were detected at concentrations ranging from 12 to 82 μ g/L in surface water sample SS08-SW01; xylenes were the primary component. Five other VOCs that are common components of diesel fuel were detected, ranging from 1.2 to 15 μ g/L (isopropyltoluene, naphthalene, n-propylbenzene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene).

Inorganics. In soil/sediment samples, no metals that exceeded background concentrations were detected at the site.

In surface water samples, four metals (barium, iron, manganese, and potassium) were detected above background concentrations. TOC, TSS, and TDS were detected in surface water sample SS08-SW01 at 19,600, 23,500, and 596,000 μ g/L, respectively.

3.4.2.3 Summary of Site Contamination. The source of contaminants detected during sampling conducted at the Crushed Drum Area (SS08) is suspected to be spills and/or leaks from the diesel day tanks inside the module train. Contaminants were not detected in the area where previous drum crushing activities were conducted. However, contaminants were detected below the module train and the concentration of contaminants decreases with distance from the west end of the module train. No previous IRP sampling is known to have been conducted at the site. The human health and ecological risks associated with the chemicals detected at the site are presented in Sections 3.4.4 and 3.4.5. Based on field data, source of contamination, and concentrations of contaminants, the area of affected media includes approximately 1,730 square feet of tundra and approximately 4,400 square feet of soil underneath the building.

3.4.3 Migration Pathways

This section describes the topography and stratigraphy of the site and the migration potential of contaminants from the site. A discussion of receptors and chemical concentrations at receptors is included.

3.4.3.1 Topography and Stratigraphy. The topography in this area is relatively flat, and most of the relief is from gravel pads and roads. The Crushed Drum Area itself consists of a large gravel pad that slopes gently north and east to the tundra. There is a small circular depression on the west side of the site adjacent to the road. The south end of the gravel pad is adjacent to the drainage pathway that runs from below the west end of the module train. The module train is located southwest of the Crushed Drum Area, and the area below the module train drains through a culvert into a ditch that extends down a slight incline along the southern side of the Crushed Drum Area. This ditch discharges into a pond located along the eastern side of the Crushed Drum Area. The pond drains to the east from both the north and south ends into a marshy area, where it ponds and infiltrates into the subsurface.

During the 1993 RI, permafrost was located at a depth of approximately four feet under gravel pads and two feet under tundra areas. Gravel pads consisted of the typical gravels and sands associated with these features, and subsurface tundra materials were of the typical stratigraphy found at Point Lay (Section 2.4.4.2).

3.4.3.2 Migration Potential.

Subsurface Migration. Analytical data indicate that soil, sediment, and surface water at this site have been contaminated with DRPH, GRPH, BTEX, VOCs, and SVOCs. The presence of contaminated sediments suggests that contaminated surface water has previously affected drainage features. Surface features at the site may infiltrate into the subsurface, and any analytes that may have been present in surface water may have entered the active layer. Therefore, there is a potential that subsurface migration has occurred at the site.

Surface Migration. Analytical data indicate that contaminants have migrated from below the module train and have affected soil, sediment, and surface water in the drainage pathway from below the west end of the module train. Because this pathway flows into relatively flat tundra, migration from this feature is probably limited. Contaminants were not detected in downgradient samples collected northeast of the tundra pond. Offsite migration in surface water, if it occurs, is probably restricted to the spring thaw, when an abundant supply of meltwater and reduced infiltration may increase the water flow from the site. Based upon these considerations, the potential for contaminant migration in surface water is considered to be limited.

Air Transport. Air transportation is not considered to be a significant mode of migration at the site (Section 2.4.4.5).

Summary of Migration Potential. Analytical data suggest that contaminants are migrating from below the west end of the module train, affecting drainage features at the site. The relatively flat topography and drainage features indicate that surface water does not generally flow from the site. Therefore, migration from the site in surface and active layer water is probably limited.

3.4.3.3 Receptors and Chemical Concentrations at Receptors.

Human Receptors. Potential human receptors at the Crushed Drum Area site include Air Force contractor personnel working at the station, visitors to the station, and an occasional local visitor

passing the site to get to recreational or subsistence lands. Human receptors could potentially be exposed to the chemicals detected in surface water and soil/sediments at the site. The primary routes of potential exposures at the site are direct contact with soil/sediment, incidental ingestion of soil/sediment, and ingestion of surface water. Because ground water and air at the Point Lay sites are not considered complete pathways of exposure, these media are not evaluated as potential pathways to human receptors.

The Point Lay Risk Assessment (U.S. Air Force 1996) evaluates in detail the risks to human health from all COCs detected at the site. The potential receptor groups were selected based on their likelihood of exposure to contaminants at the site and include DEW Line workers at the installation, and native adults and children who may visit the site. The estimated exposure point concentrations for human receptors are based on the maximum concentration of each chemical detected at the site. The potential risks to human health associated with chemicals at the site are presented in Section 3.3.4.

Ecological Receptors. Ecological receptors were evaluated in detail in the Point Lay Risk Assessment (U.S. Air Force 1996) to determine if plants and animals could potentially be impacted by the chemicals detected at the Point Lay installation. Because of the diversity of the plants and animals in the area of the Point Lay installation, a set of representative species was selected in the ERA for detailed evaluation. The species include plants, aquatic invertebrates, fish, birds, and mammals. These receptors were selected based on the species' likelihood of exposure given their preferred habitat and feeding habits. The representative species encompass a range of ecological niches in order to achieve the best characterization of the ecosystems being examined and are presented in Table 2-6.

The estimate of chemical concentrations at the ecological receptors was based on the average site-wide concentration of each COC. This approach was appropriate because few of the representative species would inhabit only one distinct site at the installation; they are more likely to be exposed to the mix of chemicals and concentrations detected on all the sites at Point Lay. The potential ecological risks associated with the chemicals detected at the site are presented in Section 3.3.5.

3.4.4 Human Health Risk Assessment

This section presents a summary of the potential human health risks associated with the chemicals detected at the Crushed Drum Area (SS08) site. The purpose of the human health risk assessment is to quantify the excess lifetime cancer risk and/or the noncancer hazard (reported as hazard index) from the contaminants detected at the site.

This summary presents the COCs at the site, the pathways by which human receptors may be exposed to site chemicals, potential risks to human health posed by each chemical through each exposure pathway, the significance of the risk and/or hazard estimate, and a comparison of site chemical concentrations to ARARs. The methods and assumptions used in calculating hazards and risks are presented in Section 2.4.1.

3.4.4.1 Chemicals of Concern. At the Crushed Drum Area (SS08), COCs identified for the soil/sediment matrix were DRPH, GRPH, and benzene. The maximum concentrations of DRPH and GRPH exceeded the background concentrations and the ARAR concentrations for petroleum hydrocarbons contamination of soil (ADEC 1991). Benzene exceeded the background concentration, the RBSL based on cancer risk, and the ARAR concentration for benzene in soil (ADEC 1991).

Benzene, barium, and manganese were identified as COCs for the surface water at the site. Benzene exceeded the background concentration, the RBSL based on cancer risk, and the ARAR, an MCL promulgated under the federal Safe Drinking Water Act. Barium exceeded the RBSL based on noncancer risk but did not exceed the ARAR, an MCL promulgated under the federal Safe Drinking Water Act. Manganese exceeded the background concentration and the RBSL based on noncancer hazard.

Table 3-8, Identification of COCs at the Crushed Drum Area, presents the maximum concentrations of chemicals detected at the site, the associated background concentrations, RBSLs, and ARARs, and identifies COCs selected in the risk evaluation.

3.4.4.2 Exposure Pathways and Potential Receptors. Because COCs were identified for soil/sediment and surface water at the site, the potential risks associated with ingestion of soil/sediment and surface water were evaluated in the risk assessment.

Three potential receptor groups were evaluated in the risk assessment: an adult assigned to a DEW Line installation (worker), an adult inhabitant of communities in the North Slope of Alaska (native), and a child living in a North Slope community (child).

3.4.4.3 Risk Characterization.

Noncancer Hazard and Cancer Risk Associated with Soils and Sediments. The noncancer hazard associated with the ingestion of soil at the Crushed Drum Area by a hypothetical native northern adult/child is 0.3 and by a DEW Line worker is 0.01, based on the maximum concentrations of the COCs. The presence of DRPH and GRPH accounts entirely for the quantifiable noncancer hazard for these receptor/pathway combinations. The excess lifetime cancer risk associated with the ingestion of soil at the site by the hypothetical native northern adult/child is 7×10^{-7} , and by a DEW Line worker is 3×10^{-8} , based on the maximum concentrations of the COCs. The presence of GRPH and benzene accounts entirely for the quantifiable excess lifetime cancer risk for these receptor/pathway combinations.

Noncancer Hazard and Cancer Risk Associated with Surface Water. The noncancer hazard associated with the ingestion of surface water at the Crushed Drum Area by a hypothetical native northern adult or by a DEW Line worker is 1.8, based on the maximum concentration of the COCs. Manganese and barium account entirely for the quantifiable noncancer hazard for these receptor/pathway combinations. Manganese alone accounts for 99 percent of the noncancer hazard.

The excess lifetime cancer risk associated with the ingestion of surface water at this site by native northern adults is 5×10^{-6} , and by a DEW Line worker is 9×10^{-7} , based on the maximum concentration of the COC. The presence of benzene accounts entirely for the quantifiable excess lifetime cancer risk for these receptor/pathway combinations.

Summary of Human Health Risk Assessment. The potential risks and hazards associated with the soil/sediment at the Crushed Drum Area are the very low noncancer hazard (hazard indices of 0.3 and 0.01), and very low cancer risk associated with the GRPH and benzene. The noncancer hazards are below one and were calculated conservatively based on a residential scenario. Therefore, the noncancer hazards associated with soil/sediment at the site are minimal. The cancer risks are well below threshold value of 1 x 10^{-6} (EPA 1991b) and are also considered minimal.

The potential risks and hazards associated with the surface water at the site are the low hazard index (1.8) associated with manganese and barium and the very low cancer risks associated with benzene. The potential risks and hazards were calculated assuming the affected surface water would be used as a sole-source water supply for 180 days per year. Based on site-specific information, the chemicals in surface water do not currently pose a health hazard nor are they likely to pose a hazard in the future. The surface water expressions at the site are frozen most of the year; many are only intermittently filled with water during the summer months. The surface water at the site is not known to be used as a water supply now, nor has it been used in the past. In conclusion, under current uses the COCs identified in surface water at the Crushed Drum Area site pose only a minimal, if any, potential threat to human health. In the unlikely event that surface water at the site is used as a sole-source drinking water supply in the future, a potential noncancer hazard to human health could exist if conditions remain constant.

In conclusion, under current uses, the COCs identified in soil/sediment and surface water at the Crushed Drum Area site pose only a minimal, if any, potential threat to human health. Based on the human health risk assessment, remedial actions are not warranted at the site.

3.4.5 Ecological Risk Assessment

The objective of the ERA is to estimate the potential impacts of chemicals detected at the installation on aquatic and terrestrial plants and animals. A summary of the methods used to assess potential ecological impacts is presented in Section 2.4.2.

3.4.5.1 Chemicals of Concern. COCs were selected based on criteria presented in Section 3.1 of the ERA. The average installation-wide concentration of COCs were used to calculate risk estimates. All sites at the installation were considered as potentially usable habitat. The COC selection process only considered the soil/sediment samples that were at or less than 1.5 feet deep. The soil/sediment samples were screened for depth because it is unlikely that any of the representative species will be exposed to soil/sediments deeper than 1.5 feet. Iron and manganese were identified as COCs in surface water, and the COCs in soils/sediments at the Crushed Drum Area were DRPH, GRPH, RRPH, BTEX, benzyl alcohol, selenium, and zinc. None of the identified COCs was associated with significant risk estimates at the Crushed Drum Area.

3.4.5.2 Summary of Ecological Risk Assessment. Based on the quantification of potential risks to ecological receptors and discussions presented in the Point Lay ERA, ecological risks at the Crushed Drum Area are minimal.

3.4.6 Conclusions and Recommendations

Sampling and analyses have determined that the Crushed Drum Area (SS08) site is contaminated with petroleum hydrocarbons (DRPH, GRPH, and RRPH), and volatile and semi-volatile organics, most of which are common components of diesel fuel. The affected areas at the site are the gravel adjacent to and below the west end of the module train and the tundra along the gravel pad northwest of the module train. The suspected source of contamination is previous spills and/or leaks from the day tanks in the west end of the module train.

The risk assessment concluded that risks posed to human health and ecological receptors by site contaminants are minimal given current site uses. The potential human health risks at the site are not of a magnitude that normally requires remedial action. The ERA concluded that the overall potential risks presented by site contaminants are minimal. Therefore, under current and future site conditions and considering the findings of the risk assessment, remediation of the site is not necessarily warranted.

Levels of petroleum compounds (primarily diesel) detected in soil/sediment at the site exceed ADEC guidance cleanup levels. In addition, site contaminants have migrated downgradient of the site, and have impacted gravel, tundra areas, and surface water. Therefore, the site is being recommended for remedial action. The affected area at the site is the gravel area below, and adjacent to, the west end of the module train and the tundra along the gravel pad northwest of the module train. The remedial action alternative recommended for the tundra and soil beneath the building is enhanced bioremediation. A complete description and evaluation of the remedial alternatives considered for this site are presented in the FS, Section 4.0.

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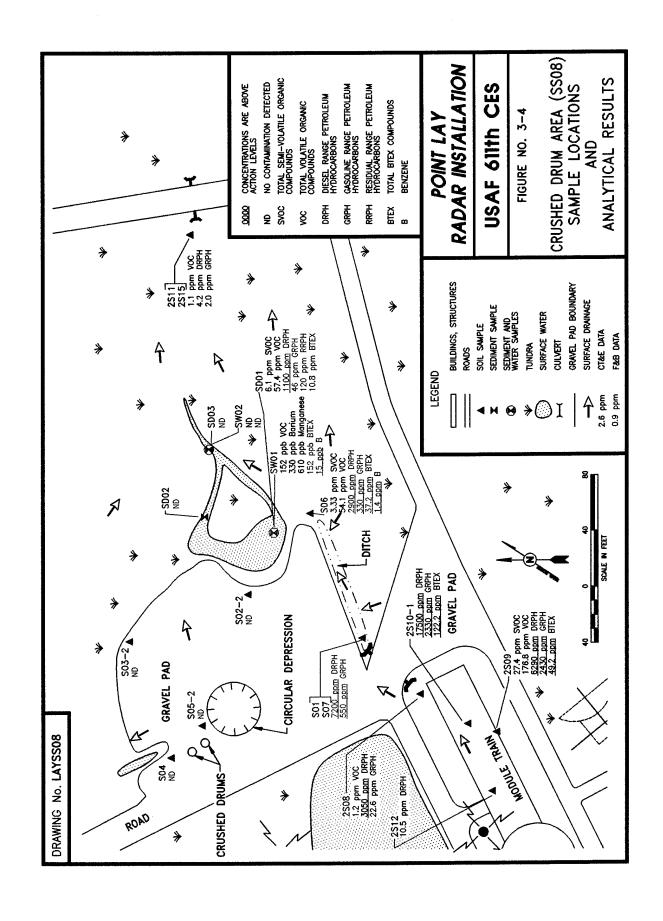


TABLE 3-7. CRUSHED DRUM AREA ANALYTICAL DATA SUMMARY

Installation: Point Lay	Installation: Point Lay Site: Crushed Drum Area (SS08)	Matrix: 3) Units:	: Soil mg/kg													
							Environm	Environmental Samples	s				Field Blanks		da.l	4
Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	So1 & So7 (Replicates)	S07 ates)	S02-2	S03-2	S04	S05-2	908	AB01	EB01	TB01	Blanks	IKS
Laboratory Sample iD Numbers					417	429	419	421	423	425	427 4327-2	4356-5	443/446 4328-2	441 4328-1	#5-82593 #3&4-82493 4356 4328	#5-82493 #182-82493 #384-82793
ANALYSES	mg/kg	mg/kg	6A/6m	mg/kg	бу/вш	ву/вш	mg/kg	тв/ка	mg/kg	mg/kg	тд/кд	-1/6π	µg/L	µ9∕L	µ9/L	mg/kg
DRPH	2	S	500 ^a	² 001≻-20€>	7,200	7,200	<500	₀ 09>	<50 ^b	<500p	\$,900 ^b	NA	<1,000 ²	Ϋ́	<1,000	< 50
GRPH	0.2	2	100	<3J ⁰ .<4J ⁰	gross	470J ⁵	هوي	era>	dra>	<2JΦ	330.b	NA	< 30.th	<50.3 ^p	<1001 >	<2J
RRPH (Approx.)	6	001	2,000³) (100	<100	<100	< 100	< 100	< 100	× 100	< 100	AN A	000'å>	Ā	<2,000	<100
BTEX (8020/ 8020 Mod.)			10 Total BTEX		HBO CE	HJ SÞ	10>	<0.1	₩.	<0.1	37.23					
Benzene	0.002	0.02	0.5	40 D>-CD D>	198 O	200 2	20'0>	80 G2	<0.05	Z0'0>	1.4	<1 ^c	15	-	<1	<0.02
Toluene	0.002	0.02		**************************************	HB1	H21	200>	20 a>	50 0×	Z0'0>	28	<1 ^C	7	Ÿ		<0.02
Ethylbenzene	0.002	0.02		<0.03-c0.04	129	F#1	20'0>	<0.02	<0.02	Z0'0>	717	<1 ^c	7	Ÿ	^	<0.02
Xylenes (Total)	0.004	0.04		<0.04-0.08	H81	нж	<0.04	*0 0×	<0.04	\$ 0'0>	72	<2 ^c	5	2 %	<2	<0.04
HVOC 8010	0.002	0.05		<0.03+<0.04	20:0>	20:0>	20.0>	<0.02	<0.02	ZQ Q>	200>	٧	*1	ľ	۲۷	<0.02J
VOC 8280																
n-Butyl- benzene	0.020	0.250		<0.030-<0.150	NA	NA	NA	NA	N	NA	4.85			7	٢	<0.020
sec-Butyl- benzene	0.020	0.250		<0.030-<0.150	NA	AN.	V	Å	Ä	A A	1.98	۲	⊽	₹	₹	<0.020
Ethylbenzene	0.020	0.250		<0.030-<0.150	NA	NA A	Ϋ́	NA	NA	NA	1.55	⊽	٧	7	7	<0.020
lsopropyl- benzene	0.020	0.250		<0.030-<0.150	NA	NA	¥	N A	N A	N	1.18	⊽	7	7	۲۰	<0.020

CT&E Data.

F&B Data. Not analyzed.

Result is an estimate. Result has been rejected.

The action levels for DRPH and RRPH are based on conversations with ADEC; final action levels have not yet been determined.

DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC.

BTEX determined by 8260 method analysis.

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TABLE 3-7. CRUSHED DRUM AREA ANALYTICAL DATA SUMMARY (CONTINUED)

S	nstallation: Poin	Installation: Point Lay Site: Crushed Drum Area (SS08)	Matrix: Units:	Soll mg/kg													
								Environme	Environmental Samples	, .				Field Blanks		Lab	- 5
	Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	S01 & S07 (Replicates)	S07 ates)	S02-2	S03-2	S04	S05-2	80S	AB01	EB01	TB01	, 100	9
	Laboratory Sample ID Numbers					417	428	419	421	423	425	427 4327-2	4356-5	443/446 4328-2	441 4328-1	#5-82593 #3&4-82493 4356 4328	#5-82493 #182-82493 #384-82793
	ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	тд/ка	mg/kg	mg/kg	mg/kg	ng/L	µg/L	µg/L	µg/L	mg/kg
σä	p-Isapropyl- toluene	0.020	0.250		<0.030-<0.150	NA	NA A	¥ Z	A A	¥ Z	٧	1.94	٥		٧	2	<0.020
L	Naphthalene	0.020	0.250		<0.030-<0.150	N	Ϋ́	ď	Ą	NA	NA	4.94	⊽	۲	-	₹	<0.020
- 0	n-Propyl- benzene	0.020	0.250		<0.030-<0.150	NA	NA	NA	NA :	A	NA	3.09	7	⊽	₹	^	<0.020
	Toluene	0.020	0.250		<0.030-<0.150	NA	NA	A A	Ϋ́	NA	NA	1.60	⊽		۲۷	7	<0.020
L	1,2,4- Trimethyl- benzene	0.020	0.250		<0.030-<0.150	N	NA	A A	Ϋ́	AA A	NA V	16.1	₹	7		⊽	<0.020
-82 -82	1,3,5- Trimethyl- benzene	0.020	0.250		<0.030-<0.150	NA	NA	¥ Z	Ā	NA	A A	6.82	⊽	₹	₹	⊽	< 0.020
×C	Xylenes (Total)	0.040	0.500		<0.060-<0.300	NA	NA V	Š.	¥ Z	∢ Z	AN A	9.91	8	\$	%	62	<0.040
<u>"</u>	SVOC 8270																
	Naphthalene	0.200	0.230		<6.90-<15.0	NA	NA	Ϋ́	Ϋ́	Ϋ́	NA	2.05	NA	<36	¥	×10	<0.200
W E	2-Methyl- napthalene	0.200	0.230		<6.90-<15.0	NA	NA	₹	¥ Z	Ą.	N	1.28	V	<36	¥ Z	<10	< 0.200
	Pesticides	0.002-0.05	0.02-0.5		C0 051 < 021	<0.02.1<0.5J	<024<05J	Ϋ́	N	N A	Ϋ́	Ϋ́	Ϋ́	<057-<001	٧	<0.02J-<0.5J	AN
	PCBs	0.01	0.1	10	<0.1	100	×6.1	t a	×0.1	<0.1	<0.1	*0*	¥.	20	NA A	<0.1	<0.1-<0.5

CT&E Data. F&B Data. Not analyzed. Result is an estimate.



TABLE 3-7. CRUSHED DRUM AREA ANALYTICAL DATA SUMMARY (CONTINUED)

		1 - 0l. 4 - 4 -													
Installation: Point Lay Site: Crushed Drum Area (SS08)	ıy Area (SS08)	Matrix: Soil Units: mg/kg													
							Environmen	Environmental Samples				Field Blanks		dad	α :
Paramoters	Detect. Limits	Quent. Limits	Action	Bkgd. Leveis	2508	5208	2810-1	2S11 & 2S15 (Replicates)	2S15 ates)	2812	AB01	2EB03	2TB03		XX.
Laboratory Sample ID Numbers					4693-1	4693-4	4693-5	4693-8	4693-10	4693-9	4356-5	4692-17	4692-16	4358 4692	4693
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	J/Brl	μg/L	µg/L	µg/L	mg/kg
ОЯРН	4.00	4.00	500 ^a	<50³-<100³	3,050	6,290	17,500	<4.00	4.19 ^d	10.5 ^d	A A	N	NA A	ΑN	< 4.00
GВРН	0.400	0.400-0.500	100	<3.1 ⁰ .<4.3 ⁰	22.6	2,430	2,330	<0.500	1.97	< 0.500	NA	N A	N	NA	<0.400
BTEX (8020/8020 Mod.)			10 Total BTEX	60 13 c0 20	NA	NA	122.2	<0.125	N	<0.125					
Benzene	0.020	0.025-4.00	0.5	<0.02 <0.04	NA	NA	<4.00	<0.025	N	<0.025	<+د	<1c	<1 _C	۲۷	<0.020
Toluene	0.020	0.025-4.00		¥0:05-<0:04	NA	NA	12.4	<0.025	VA	<0.025	د ا _د	<1 ^c	<1 ^c	۲۷	<0.020
Ethylbenzene	0.020	0.025-4.00		¥0.03 <0.04	NA	NA	18.2	<0.025	¥ Z	<0.025	<1 _C	<1 _c	<1 ^c	<1	<0.020
Xylenes (Total)	0.040	0.050-8.00		<0.04 <0.08	NA	NA	91.6	<0.050	Y V	<0.050	<2°	₅ Z>	<2°	<2	<0.040
VOC 8260															
Benzene	0.020	0.020-2.50	0.5	<0.030-<0.150	<0.100J	<2.50	¥.	Ϋ́	0.021	¥.	٧	Ÿ	٧	2	<0.020
n-Butylbenzene	0.020	0.020-2.50		<0.030-<0.150	<0.100J	11.6	Ą	Ą	<0.020	Ϋ́	₹	٠	٧	12	<0.020
sec-Butylbenzene	0.020	0.020-2.50		<0.030-<0.150	<0.100J	5.03	¥.	Ϋ́	< 0.020	Ϋ́	٧	٧			<0.020
Ethylbenzene	0.020	0.020-2.50		<0.030-<0.150	<0.100J	5.35	Ą	NA	0.057	V A	٧	۲۰	۲	<u>^</u>	<0.020
Isopropylbenzene	0.020	0.020-2.50		<0.030-<0.150	<0.100	3.23	NA A	NA	<0.020	Ϋ́	٧	٧			<0.020
p-Isopropyltoluene	0.020	0.020-2.50		<0.030-<0.150	<0.100J	6.04	NA A	NA	<0.020	Ϋ́	⊽	٧	7	^	<0.020
Naphthalene	0.020	0.020-2.50		<0.030-<0.150	<0.100J	26.2	NA V	Ϋ́	0.100	ΑN	<u>۲</u>	7	<1	۲۷	<0.020

CT&E Data.

Not analyzed. F&B Data.

DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC. BTEX determined by 8260 method analysis. The laboratory reported that the EPH pattern in this sample was not consistent with a middle distillate fuel. The action level for DRPH is based on conversations with ADEC; a final action level has not yet been determined. Result is an estimate.

TABLE 3-7. CRUSHED DRUM AREA ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Site: Crushed Drum Area (SS08)	y Area (SS08)	Matrix: Soil Units: mg/kg													
							Environmen	Environmental Samples				Field Blanks		Lab	<u>a</u>
Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	2S08	5209	2S10-1	2S11 & 2S15 (Replicates)	2S15 ates)	2812	AB01	2EB03	2TB03	N N	Jks
Laboratory Sample ID Numbers					4693-1	4683-4	4693-5	4693-8	4693-10	4693-9	4358-5	4892-17	4692-16	4358 4692	4693
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/L	J/6rl	µg/L	µg/L	mg/kg
n-Propylbenzene	0.020	0.020-2.50		<0.030-<0.150	<0.100J	7.88	Ϋ́	Ϋ́	0.023	¥ Z	۲	~	2	۲	<0.020
Toluene	0.020	0.020-2.50		<0.030-<0.150	0.308J	5.72	Y.	Ϋ́	0.240	¥.			٧	٧	<0.020
1,2,4- Trimethylbenzene	0.020	0.020-2.50		<0.030-<0.150	0.264J	48.0	ν A	Ϋ́	0.142	A A	₹	₹	۲۷	⊽	<0.020
1,3,5- Trimethylbenzene	0.020	0.020-2.50		<0.030-<0.150	0.153J	19.6	NA	NA	0.054	A A		7	7	۲	<0.020
Xylenes (Total)	0.040	0.040-5.00		<0.060-<0.300	0.490	38.1	NA	NA	0.500	NA	<2 >	<2	<2	~	<0.040
SVOC 8270															
Acenaphthene	0.200	0.220-2.28		<6.90-<15.0	NA A	1.85J	NA	NA NA	<0.220	Ϋ́	NA V	Y Y	AN	× 10	<0.200
di-n-Butylphthalate	0.200	0.220-2.28	8,000	< 6.90-< 15.0	NA	8.48B	NA	NA	1.95B	Ą	NA	NA	Ą	<10	2.31
Dibenzofuran	0.200	0.220-2.28		<6.90-<15.0	A	1.83J	NA	N A	<0.220	Ν	NA	NA	NA	< 10	<0.200
Fluorene	0.200	0.220-2.28		<6.90-<15.0	Ϋ́	1.95J	NA	N.	<0.220	A N	NA	NA	NA	< 10	<0.200
2-Methyl- naphthalene	0.200	0.220-2.28		<6.90-<15.0	NA	11.7	Ϋ́	¥ Z	<0.220	¥ Z	A N	NA	NA	<10	<0.200
Naphthalene	0.200	0.220-2.28		<6.90-<15.0	NA	7.66	NA	NA	<0.220	NA	NA	NA	NA	<10	<0.200
Phenanthrene	0.200	0.220-2.28		<6.90-<15.0	NA	2.44	NA	NA	<0.220	N A	Ϋ́	NA	NA	<10	<0.200

CT&E Data.
Not analyzed.
The analyte was detected in the associated blank.
Result is an estimate.

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TABLE 3-7. CRUSHED DRUM AREA ANALYTICAL DATA SUMMARY (CONTINUED)

Detect	Installation: Point Lay Site: Crushed Drum Area (SS08)		Matrix: Sediment Units: mg/kg	lent									
Detect. Ouart. Action Blgd. SD01 SD02 SD03 AB01 EB01 TB01						Enviror	mental Samp	selc		Field Blanks		La	۰۵
He D	Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	SD01	SD02	EOGS	AB01	EB01	TB01	Blan	ıks
Maying M	Laboratory Sample ID Numbers					463 4327-1	465	467	4356-5	443/446	441 4328-1	#5-82593 #3&4-82493 4328 4356	#5-82593 #1&2-82493 #3&4-82793 4327
10 20 200 500° 460° 1,100° 460	ANALYSES	mg/kg	mg/kg	mg/kg	By/Bш	mg/kg	mg/kg	mg/kg	#B/L	μg/L	η/Gπ	μg/L	mg/kg
10 10 2 100 2.000° 46J° 2J° NA 2.000° NA 2.00° NA 2.00° 2.0000° 2.000° 2.0	DRPH	20	200	500ª	<50°-<100°	1,100	<700 ^b	<200°	NA	<1,000 ^b	NA	<1,000	<50
40-150 400-1,500 2,000° 6,100 120 6,1500 6,400 NA 6,2000 NA 6,2000 NA 6,1500 NA 6,15	GRРH	0.2	2	100	<3J ⁵ .<4J ⁵	46J ^b	<2J ^b	<2JP	NA	<50J ^b	<50u ^b	<1007	<2J
10 Total BTEX	RRPH (Approx.)	40-150	400-1,500	2,000ª	<100	120	<1,500	< 400	NA	<2,000	N A	<2,000	× 100
0.002-0.029 0.02-0.29 0.05 <0.02-0.029	BTEX (8020/8020 Mod.)			10 Total BTEX	<0.13<0.20	10.83J	<1.44	4:0>					
0.002-0.029 0.02-0.29 <0.02-0.29	Benzene	0.002-0.029	0.02-0.29	0.5	<0.02-<0.04	0.23J	<0.29	<0.08	<1°		₹		<0.02
0.002-0.029	Toluene	0.002-0.029	0.02-0.29		<0.02-<0.04	+	<0.29	<0.08	۸1°	^	7		<0.02
0.004-0.058	Ethylbenzene	0.002-0.029	0.02-0.29		<0.03<0.04	1.9	<0.29	80°0>	۸۱۰	7	7	V	<0.02
0.002-0.029 0.02-0.29	Xylenes (Total)	0.004-0.058	0.04-0.58		<0.04-<0.08	7.7J	<0.57	<0.16	<2°	<2	<2	<2	<0.04
0.020 0.250 <0.030-<0.150 3.66J NA NA <1 <1 <1 0.020 0.250 <0.030-<0.150	HVOC 8010	0.002-0.029	0.02-0.29		<0.03-<0.04	<0.02√	<0.29	<0.08	A A	₹	7	~	<0.02J
0.020 0.250 0.250 0.030-0.150 3.66J NA NA <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	VOC 8260												
0.020 0.250 0.250 0.030-<0.150 1.51J NA NA <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	n-Butylbenzene	0.020	0.250		<0.030-<0.150	3.66J	NA	ΝΑ	^				<0.020
0.020 0.250 <0.030-<0.150 2.30J NA NA <1 <1 <1 <1	sec-Butylbenzene	0.020	0.250		<0.030-<0.150	1.51J	A A	N A	٧	⊽	<u>۲</u>	⊽	<0.020
0 000 0 0050 0 0000 0 0000 0 0000 0 0000 0 0000 0 0	Ethylbenzene	0.020	0.250		<0.030-<0.150	2.30J	N A	NA	V	۲	7		<0.020
1/ C. 100.00 C.	Isopropylbenzene	0.020	0.250		<0.030-<0.150	1.34J	A A	Ϋ́	⊽	⊽	⊽	<u>\</u>	<0.020

CT&E Data. **□ ∰** ₹ ¬ π

F&B Data.

Result is an estimate. Not analyzed.

DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC. BTEX determined by 8260 method analysis. The action levels for DRPH and RRPH are based on conversations with ADEC; final action levels have not yet been determined.

TABLE 3-7. CRUSHED DRUM AREA ANALYTICAL DATA SUMMARY (CONTINUED)

Parameters Cuant. Limits Action Levels Bkgd. Levels EDMINOMENTALISE ACTION Levels EDMIN Levels SDD2 SDD2 SDD2 SDD2 SDD2 SDD3 ABD1 EBD1 Laboratory Sample ID Numbers mg/kg mg/k	<u> </u>	Installation: Point Lay Site: Crushed Drum Area (SS08)		Matrix: Sediment Units: mg/kg	nent									
Laboratory Sample ID Defect Limits Cuant. Limits Levels Levels SD01 SD02 SD03 AB01 EB Laboratory Sample ID Numbers Limits Limits Limits Limits Limits 4433 463 4			ı		,		Enviror	mental Samp	oles		Field Blanks		Lab	۔ م
Laborationy Sample ID Numbers Numbers mg/kg		Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	SD01	SD02	SD03	AB01	EB01	TB01	bianks	ıKs
e mg/kg mg/	1\TRI 3-7	Laboratory Sample ID Numbers					463 4327-1	465	467	4356-5	443/446 4328-2	441 4328-1	#5-82593 4328 4356	#5-82593 #1&2-82493 4327
Pisopropyltoluene 0.020 0.250 0.020		ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	η/βπ	μg/L	η/Bπ	η/bπ	mg/kg
Naphthalene 0.0250 0.2550 0.020-0.150 8.10J NA NA < 1 n-Propylbenzene 0.020 0.250 0.020 0.020 0.020 0.030-0.150 2.81J NA NA < 1		p-isopropyltoluene	0.020	0.250		<0.030-<0.150	1.45J	NA	A N		⊽	⊽	^	<0.020
n-Propylbenzene 0.020 0.250 0.020-0.150 2.81J NA NA < 1 Tolluene 0.020 0.250 0.0350-0.150 2.11J NA NA < 1	<u>—</u>	Naphthalene	0.020	0.250		<0.030-<0.150	8.10J	NA	Š		۷.	₹	\ -	<0.020
Tolluene 0.020 0.250 0.0261 0.0261<		n-Propylbenzene	0.020	0.250		<0.030-<0.150	2.81J	A A	Ϋ́	<u>۲</u>	٧	7	^	<0.020
1,2,4-Trimethylbenzene 0.020 0.250 < 0.030-<0.150 5.31J NA NA < 1 1,3,5-Trimethylbenzene 0.020 0.250 < 0.030-<0.150		Toluene	0.020	0.250		<0.030-<0.150	2.11J	A A	Š.			V	7	<0.020
1,3,5-Trimethylbenzene 0.020 0.250 < 0.030-<0.150 5.31 J NA NA < 1 Xylenes (Total) 0.040 0.500 < 0.060-<0.300		1,2,4-Trimethylbenzene	0.020	0.250		<0.030-<0.150	13.9J	NA	N A	٧		٧	^	<0.020
Xylenes (Total) 0.040 0.500 < 0.060-<0.300 14.87J NA NA < 2 SVOC 8270 Accidential Strain Strai	<u></u>	1,3,5-Trimethylbenzene	0.020	0.250		<0.030-<0.150	5.31	NA	Š	٧	7		^	<0.020
hol 0.200 0.240 <6.90-<15.0 0.680 NA NA NA NA e 0.200 0.240 <6.90-<15.0 2.02 NA NA NA NA ne 0.200 0.240 <6.90-<15.0 2.43 NA NA NA NA ne 0.200 0.240 <6.90-<15.0 0.661 NA NA NA NA e 0.200 0.240 <6.90-<15.0 0.261 NA NA NA NA	06	Xylenes (Total)	0.040	0.500		<0.060-<0.300	14.87J	NA	¥ V	<2	<2	~ 5	<2	<0.040
0.200 0.240 <6.90-<15.0 0.680 NA NA NA NA 0.200 0.240 <6.90-<15.0	<u> </u>	SVOC 8270												
0.200 0.240 <6.90-<15.0 2.02 NA NA NA NA 0.200 0.240 <6.90-<15.0		Benzyl Alcohol	0.200	0.240			0.680	NA	N A	NA	<36	ΝΑ	<10	<0.200
0.200 0.240 <6.90-<15.0 2.43 NA NA NA 0.200 0.240 <6.90-<15.0		Naphthalene	0.200	0.240			2.02	A A	A A	N A	<36	NA A	<10	<0.200
0.200 0.240 < 6.90-<15.0 0.661 NA		2-Methylnapthalene	0.200	0.240			2.43	NA	Ā	NA A	<36	AN A	<10	<0.200
0.200 0.240 <6.90-<15.0 0.261 NA NA NA		Phenanthrene	0.200	0.240			0.661	N A	NA	NA	<36	N A	<10	<0.200
		Fluoranthene	0.200	0.240			0.261	NA	N A	NA	<36	A	<10	<0.200
PCBs 0.01-0.15 0.1-1.5 10 <0.1 <0.1 <1.5 <0.4 NA <2		PCBs	0.01-0.15	0.1-1.5	10	- CD.1	<0.1	<1,5	×0.4	NA	<2	NA	<10	<0.1

CT&E Data. F&B Data. Not analyzed. Result is an estimate.

TABLE 3-7. CRUSHED DRUM AREA ANALYTICAL DATA SUMMARY (CONTINUED)

ation: Point Lay Matrix: Soil/Sediment Crushed Drum Area (SS08) Units: mg/kg	Matrix: Soil/Sedime Units: mg/kg	Soil/Sedime mg/kg	ent Bkad, Re	ande	METALS	METALS ANALYSES	Environmental Samples	səld	L.	Field Blank	
Parameters	Detect. Limits	Quant. Limits	Action Levels	from 7 DEW Line Installations	908	SD01				EB01	Blanks
Laboratory Sample ID Numbers					4327-2	4327-1				4328-2	
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg				μg/L	
Aluminum	0.35	2		1,500-23,000	3,400	1,700				<100	
Antimony	N/A	26		<7.8-<230	<56J	<56J				×100	
Arsenic	0.11	26		<4.9-7.0	<56	<56				<100	
Barium	0.024	1		27-390	360	330				<50	
Beryllium	N/A	2.8		<2.6-6.4	<2.8	<2.8				<50	
Cadmium	0.33	2.8		<3.0-<27	<2.8	<2.8				<50	
Calcium	69'0	4		360-59,000	1,200	1,200				<200	
Chromium	0.066	1		<4.3-47	6.7	4.7				<50	
Cobalt	N/A	5.6		<5.1-12	<5.6	<5.6				<100	
Copper	0.045	1		<2.7-45	8.6	7.1				<50	
Iron	0.50	2		5,400-35,000	23,000	21,000				<100	
Lead	0.13	5.6		<5.1-22	<5.6	<5.6				<100	
Magnesium	96.0	4		360-7,400	1,600	920				<200	
Manganese	0.025	-		25-290	2207	2007				<50	
Molybdenum	N/A	2.8		<2.5-<11	<2.8	<2.8				<50	
Nickel	0.11	-		4.2-46	15	13				<50	
Potassium	23	91		<300-2,200	290	420				<5,000	<5,000

CT&E Data.

|/A Not available.

Result is an estimate.

TABLE 3-7. CRUSHED DRUM AREA ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Site: Crushed Drum Area (SS08)	y Area (SS08)		Matrix: Soil/Sediment Units: mg/kg	nent	METALS	METALS ANALYSES					
c		6	1000	Bkgd. Range			Environmer	Environmental Samples	Ë	Field Blank	Lab Blanks
Parameters	Limits	Limits	Levels	DEW Line Installations	908	SD01				EB01	
Laboratory Sample ID Numbers					4327-2	4327-1				4328-2	4328 4327
ANALYSES	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg				μg/L	#g/L
Selenium	1.2	2-56		<7.8-<170	17.1	<56				<100	×100
Silver	0.53	28		<3-<110	<28R	<28R				<50J	<50
Sodium	0.55	ß		<160-680	94	87				<250	<250
Thallium	0.011	0.28-0.29		<0.2-<0.82	<0.28	<0.29				<5	<5
Vanadium	0.036	, -		6.3-59	19	13				<50	<50
Sinc	0.16	-		9.2-95	37	44				<50	<50

CT&E Data. Result is an estimate. Result has been rejected.

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TABLE 3-7. CRUSHED DRUM AREA ANALYTICAL DATA SUMMARY (CONTINUED)

AY\TABLES	Installation: Point Lay Site: Crushed Drum Area (SS08)	(8088)	Matrix: Surface Water Units: μg/L	rface Water										
S\4109					i		Environm	Environmental Samples	oles		正	Field Blanks		Lab
66130	Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	SW01	SW02			*	AB01	EB02	TB02	bianks
1\TBL3-7	Laboratory Sample ID Numbers					573/576 4356-6	577/578 4356-7			4	4356-5	557/572 4356-2	569 4356-1	#5-82793 #3&4-82593 4356
	ANALYSES	μg/L	μg/L	μg/L	1/6#	μg/L	η/bπ				#g/L	η/Gπ	η/βπ	η/Bπ
	DRPH	100	1,000		<1,000 ²	<1,000 ^b	<1,000 ^b				NA	4000; 4000;	Ϋ́	<1,000
	GRРH	10	100		<50J ^b	<100.J [#]	<100.b				NA	< 100 J	4 100 Ja	<1007
	RRPH (Approx.)	200	2,000		<2,000	<2,000	<2,000				N A	<2,000	N A	<2,000
	BTEX (8020/8020 Mod.)													-
	Benzene	0.1	,-	5	<1	15	Ÿ				<1 ^c	V	٧	
<u></u> 3	Toluene	0.1	1	1,000	<1	43	۶				<16	<u>^</u>	٧	
-89	Ethylbenzene	0.1	-	700	- <	12.3	V				<1 ₀	7	٧	
<u> </u>	Xylenes (Total)	0.2	2	10,000	<2	SS.	ru V				<2°	Ņ,	QV V	<2
<u></u>	HVOC 8010	0.1	-		>	7	7				Ą	7	٧	
	VOC 8260										ŀ	•		
	Benzene	1	-	5	^	7.0	A A				⊽	⊽	₹	
	Ethylbenzene	-	-	700	^	6.5	NA				V	٧.	<1	<1

CT&E Data.

F&B Data.

Not analyzed. Result is an estimate. DRPH and GRPH concentrations reported for these samples are equivalent to diesel and gasoline range organics (DRO and GRO) as defined by ADEC. BTEX determined by 8260 method analysis.

TABLE 3-7. CRUSHED DRUM AREA ANALYTICAL DATA SUMMARY (CONTINUED)

<u> </u>	Installation: Point Lay Site: Crushed Drum Area (SS08)	(8808)	Matrix: Surface Water Units: μg/L	face Water										
				i			Environmental Samples	ıntal Sam	ples		ᄪ	Field Blanks		Lab
	Parameters	Detect. Limits	Quant. Limits	Action Levels	Bkgd. Levels	SW01	SW02			Ā	AB01	EB02	TB02	Slanks
1/10/27	Laboratory Sample ID Numbers					573/576 4356-6	577/578 4356-7			4	4356-5	557/572 4356-2	569 4356-1	#5-82793 4356
<u> </u>	ANALYSES	η/Bπ	7/6#	η/6π	μg/L	η/Gπ	η/Gπ				#g/L	μg/L	μg/L	μg/L
<u> </u>	Isopropylbenzene	1	1		<1	1.2	Ą				⊽	⊽	₹	~
<u> </u>	Naphthalene	1	+		<1	15	A N				<u>~</u>	⊽	<u>^</u>	-V
L	n-Propylbenzene	-	1		\ -	1.3	Ϋ́				⊽	₹	~	<
1	Toluene	-	1	1,000	~1	30	N				⊽	V	V	~
<u> </u>	1,2,4-Trimethylbenzene				<1	14	N				₹	₹	V	
<u> </u>	1,3,5-Trimethylbenzene	-	1		<1	11	A				⊽	7	Ÿ	^
3-9	Xylenes (Total)	2	2	10,000	<2	99	A				<2 >	<2 <2	<2	^
<u> </u>	SVOC 8270	10	17		<20-<31	<17	N A				¥	<25	NA A	<10
<u> </u>	PCBs	0.2	2	0.5	es v	Ş	ry V				¥.	Q V	A V	<2J
	TOC	5,000	5,000		31,700-40,000	19,600	A				¥	A A	AN	AN
	TSS	100	200		6,000-77,000	23,500	A A				¥	A A	NA A	<200
	TDS	10,000	10,000		149,000-151,000	596,000J	NA				Ā	NA	ΑN	<10,000

CT&E Data. F&B Data. Not analyzed. Result is an estimate.

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TABLE 3-7. CRUSHED DRUM AREA ANALYTICAL DATA SUMMARY (CONTINUED)

AY\TABLES	Installation: Point Lay Site: Crushed Drum Area (SS08)	y Area (SS08)	Matrix:) Units:	x: Surface Water : μg/L	Vater	METALS ANALYSES: TOTAL (DISSO	LYSES: TOT, (DISS	TOTAL (DISSOLVED)				
S\4109					Bkgd. Range		Ш	Environmental Sample	l Sample		Field Blank	Lab
66130	Parameters	Detect. Limits	Quant. Limits	Action Levels	from 7 DEW Line Installations	SW01					EB02	Biank
1\TBL3-7	Laboratory Sample ID Numbers					4356-6					4356-2	4356
	ANALYSES	πg/L	µg/L	η/βπ	μg/L	J/6#					η/6π	#g/L
	Aluminum	17.4	100		<100-350 (<100-340)	120 (< 100)					< 100< 100)	×100
	Antimony	N/A	100	9	<100 (<100)	<100 (<100)					<100 (<100)	× 100
	Arsenic	5.3	100	20	<100 (<100)	<100 (<100)					<100 (<100)	×100
	Barium	1.2	20	2,000	<50-93 (<50-91)	330 (270)					<50 (<50)	<50
3-91	Beryllium	N/A	50	4	<50 (<50)	<100 (<50)					<50 (<50)	< 50
	Cadmium	1.7	50	5	<50 (<50)	<50 (<50)					<50 (<50)	<50
	Calcium	34.5	200		4,500-88,000 (4,100-86,000)	57,000 (57,000)		_			410 (<200)	<200
	Chromium	3.29	20	100	<50 (<50)	<50 (<50)					<50 (<50)	< 50
	Cobalt	N/A	100		<100 (<100)	<100 (<100)					<100 (<100)	×100
	Copper	2.3	50	1,300	<50 (<50)	<50 (<50)					<50 (<50)	< 50
C	Iron	25	100		180-2,800 (<100-1,600)	6,300 (<100)					<100 (<100)	× 100
94 MA	Lead	9.9	100	15	<100 (<100)	<100 (<100)					<100 (<100)	× 100

CT&E Data. Not available.

TABLE 3-7. CRUSHED DRUM AREA ANALYTICAL DATA SUMMARY (CONTINUED)

Installation: Point Lay Site: Crushed Drum Area (SS08)	oint Lay Drum Area	(8088)	Matrix: Units:	Surface Water μg/L	Vater	METALS ANALYSES:	AALYSES: TOTAL (DISSOLVED)			
		l .			Bkgd. Range		Environmental Sample	Field Blank	Lab	
Parameters		Detect. Limits	Quant. Limits	Action Levels	from 7 DEW Line Installations	SW01		EB02	Blan	Ţ
Laboratory Sample ID Numbers	eldm 8					4356-6		4356-2	4356	99
ANALYSES		μg/L	η/βπ	μg/L	μg/L	μg/L		η/bπ	μg/L	7
Magnesium	7	47.8	200		2,900-53,000 (2,600-54,000)	29,000 (28,000)		<200 (<200)	< 200	8
Manganese		1.24	20		<50-510 (<50-120)	610 (540)		<50 (<50)	*	< <u>5</u> 0
Molybdenum		A/Z	20		<50 (<50)	<50 (<50)		<50 (<50)	*	<50
Nickel		5.5	20	100	<50) (<50)	<50 (<50)		<50 (<50)	*	<50
Potassium	-	1,154	5,000		<5,000-5,000 (<5,000-5,000)	5,400 (6,100)		<5,000 (<5,000)	<5,000	8
Selenium		62.4	91	20	<100 (<100)	<100 (<100)		<100 (<100)	<100	8
Silver		2.6	20	50	<50) (<50)	<50 (<50)J		<50 (<50)	Ÿ	<50
Sodium		27.72	250		8,400-410,000 (8,200-450,000)	28,000		370 (400)	<250	18
Thallium		0.57	5	2	<5 (<5)	<5 (<5)		<5) (<5)	V	<.5 <.5
Vanadium		1.8	50		<50 (<50)	<50 (<50)		<50 (<50)	Ÿ	<50 50
Zinc		8.2	20		<50-160 (<50)	<50 (<50)		<50) (<50)	Ÿ	<50

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CT&E Data. Not available. Result is an estimate.

TABLE 3-8. IDENTIFICATION OF CHEMICALS OF CONCERN AT THE CRUSHED DRUM AREA (SS08)

Desirative							C	8 1000		
Acen aphthetiene	STE	MATRIX	CHEMICAL DETECTED	MAXIMUM	UNITS	BACKGROUND	CANCER	NON-CANCER	ARAR	CHEMICAL OF CONCERN
GRPH 2,430 mg/kg <0.02	Crushed Drum Area	Soil/Sediment	DRPH	17,500	mg/kg	<50-<100	1	1	500°	Yes
120 mg/kg	(8088)		GRРH	2,430	mg/kg	<3-<4	•	•	100°	Yes
1.4 mg/kg			яврн	120	mg/kg	<100	1	1	2,000°	No
12.4 mg/kg	- Cardada		Benzene	1.4	mg/kg	<0.02-<0.04	2.2	\$	0.5°	Yes
e 1.85J mg/kg <0.03 e 1.85J mg/kg <0.04 e 1.85J mg/kg <0.03 nlate 8.48B mg/kg <0.03 nne 5.03 mg/kg <0.03 nne 6.04 mg/kg <0.03 nne 6.04 mg/kg <0.03 nalene 11.7 mg/kg <0.03 nalene 6.04 mg/kg <0.03 nalene 7.88 mg/kg <0.03 benzene 7.88 mg/kg <0.03 shorzene 48.0 mg/kg <0.03 shorzene 19.6 mg/kg <0.03 3,400 mg/kg <1,500 360 mg/kg 1,500			Toluene	12.4	mg/kg	<0.02-<0.04	:	5,400	1	N _o
e 1.85J mg/kg <0.04 e 1.85J mg/kg <0.03 nne 5.03 mg/kg <0.03 nne 5.03 mg/kg <0.03 nne 6.04 mg/kg <0.03 nne 7.88 mg/kg <0.03 nne 7.88 mg/kg <0.03 nne 7.89 mg/kg <0.03 nne 7.89 mg/kg <0.03 nne 6.04 mg/kg <0.03 nne 6.04 mg/kg <0.03 nne 6.03 nne 6.04 mg/kg <0.03 nne 6.04 mg/kg <0.03 nne 6.04 mg/kg <0.03			Ethylbenzene	18.2	mg/kg	<0.03-<0.04	:	2,700	1	No.
Alcohol 1.85J mg/kg <6.9 Alcohol 0.680 mg/kg <6.9			Xylenes (Total)	91.6	mg/kg	<0.04-<0.08	!	54,000	1	N _o
Alcohol 0.680 mg/kg <6.9 Instrant 11.6 mg/kg <0.03- Albenzene 5.03 mg/kg <0.03- Auran 1.83J mg/kg <6.9 Albenzene 3.23 mg/kg <6.9 Alpenzene 6.04 mg/kg <0.03- Alpenzene 2.44 mg/kg <0.03- Inaphthalene 7.88 mg/kg <0.03- Inethylbenzene 7.88 mg/kg <0.03- Imethylbenzene 48.0 mg/kg <0.03- Im 3,400 mg/kg <0.03- Im 3,400 mg/kg <0.03- Im 3,400 mg/kg <0.03-		***************************************	Acenaphthalene	1.85J	mg/kg	<6.9-<15.0	;	-	;	Yes*
renzene 11.6 mg/kg <0.03- //benzene 5.03 mg/kg <6.9			Benzyl Alcohol	0.680	mg/kg	<6.9-<15.0	:	8,100	1	N _o
/ibenzene 5.03 mg/kg <0.03- yiphthalate 8.48B mg/kg <6.9			n-Butylbenzene	11.6	mg/kg	<0.03-<0.150	1	1	1	Yes*
ylphthalate 8.48B mg/kg <6.9 furan 1.83J mg/kg <6.9			sec-Butylbenzene	5.03	mg/kg	<0.03-<0.150	1	3	I	Yes*
furan 1.83J mg/kg <6.9 e 1.95J mg/kg <6.9			di-n-Butylphthalate	8.48B	mg/kg	<6.9-<15.0	*	2,700	8,000 ^d	No
1.95J mg/kg <6.93 mg/kg c0.03-py/toluene			Dibenzofuran	1.83J	mg/kg	<6.9-<15.0	ı	1		Yes*
ribenzene 3.23 mg/kg < 0.03- pyltoluene 6.04 mg/kg < 0.03-			Fluorene	1.95J	mg/kg	<6.9-<15.0	1	1,080	;	No
pyltoluene 6.04 mg/kg < 0.03- Inaphthalene 11.7 mg/kg < 6.9			Isopropylbenzene	3.23	mg/kg	<0.03-<0.150	:	;	ı	Yes*
Inaphthalene 11.7 mg/kg <6.9 slene 26.2 mg/kg <0.03-			p-Isopropy!toluene	6.04	mg/kg	<0.03-<0.150	1	ŧ	ı	Yes*
lene 26.2 mg/kg <0.03-			2-Methylnaphthalene	11.7	mg/kg	<6.9-<15.0	1	:	1	Yes*
threne 2.44 mg/kg < 6.9 Ibenzene 7.88 mg/kg < 0.03-			Naphthalene	26.2	mg/kg	<0.03-<0.150	:	1,100	1	No
benzene 7.88 mg/kg < 0.03- methylbenzene 48.0 mg/kg < 0.03-			Phenanthrene	2.44	mg/kg	<6.9-<15.0	1	:	1	Yes*
methylbenzene 48.0 mg/kg < 0.03- im 3,400 mg/kg 1,500- im 360 mg/kg 1,500-			n-Propylbenzene	7.88	mg/kg	<0.03-<0.150	1	1	1	Yes*
methylbenzene 19.6 mg/kg < 0.03- Im 3,400 mg/kg 1,500- 360 mg/kg 1,500-			1,2,4-Trimethylbenzene	48.0	mg/kg	<0.03-<0.150	1	ı	1	Yes*
360 mg/kg 1,500 mg/kg			1,3,5-Trimethylbenzene	19.6	mg/kg	<0.03-<0.150	:		1	Yes*
360 mg/kg			Aluminum	3,400	mg/kg	1,500-25,000	1	1	1	No
-			Barium	360	mg/kg	27-390	1	1,890	ı	No
1,200 mg/kg			Calcium	1,200	mg/kg	360-59,000	1	•	-	No

TABLE 3-8. IDENTIFICATION OF CHEMICALS OF CONCERN AT THE CRUSHED DRUM AREA (SS08) (CONTINUED)

MAXIMUM	MAXIMUM
TION UNITS	_ 11
6.7 mg/kg	
8.6 mg/kg	
23,000 mg/kg	انت ن
1,600 mg/kg	i
220J mg/kg	ı
15 mg/kg	ı
590 mg/kg	
17J mg/kg	•
94 mg/kg	
19 mg/kg	
44 mg/kg	
15 µg/L	
43 μg/L	
12J µg/L	
82J #g/L	
1.2 µg/L	
15 µg/L	1
1.3 µg/L	
14 µg/L	
11 µg/L	
120 µg/L	
330 µg/L	
57,000 µg/L	
6,300 µg/L	
_	

TABLE 3-8. IDENTIFICATION OF CHEMICALS OF CONCERN AT THE CRUSHED DRUM AREA (SS08) (CONTINUED)

						ac	RBSL ^a		r o
SITE	MATRIX	CHEMICAL DETECTED	CONCENTRATION	UNITS	BACKGHOUND	CANCER	NON-CANCER	ARAR	CONCERN
Crushed Drum Area	Surface Water ^h	Manganese	610	η/βπ	<50-510	1	18.3		Yes
(8088)	(Continued)	Potassium	5,400	μg/L	<5,000-5,000		-	1	No
(Continued)		Sodium	28,000	7/6#	8,400-410,000	1	1	ı	No

The COCs selected for the site do not include metals that are considered essential human nutrients or analytes that do not have an RBSL or ARAR; however, these chemicals were discussed in the Point Lay Risk Assessment (U.S. Air Force 1996)

Risk-Based Screening Level.

Applicable or Relevart and Appropriate Requirement.

a D

55 FR 30798, Proposed Rule RCRA Corrective Action for SWMUs 40 CFR [Section 264.521 (a)(2)(i-iv)], Health-Based Criteria for Systematic Toxicant. ADEC 1991.

MCL, 52 FR 25690.

o o

MCL, 56 FR 3526 (30 January 1991).

MCL, 56 FR 30266 (01 January 1991).

The concentrations reported for metals in surface water are total metals.

The analyte was detected in the associated blank.

Result is an estimate.

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4.0 FEASIBILITY STUDY

The purpose of this section is to present the FS of remedial alternatives for the sites at Point Lay radar installation recommended for remedial action. These sites were identified based on the findings of the 1993 RI, reported in Sections 1.0 through 3.0 of this document, and the final Point Lay Risk Assessment (U.S. Air Force 1996). The Point Lay sites recommended for remedial action and covered in this FS are:

- Deactivated Landfill (LF01);
- Garage (SS06);
- Drainage Pathway from POL Tanks (SS07); and
- Crushed Drum Area (SS08).

Complete RI results for these sites are presented in Section 3.0. This FS describes the evaluation of remedial alternatives used as the basis for the selection of the proposed remedial actions for the sites. The four sites investigated during the RI at Point Lay are all recommended for remedial action.

This FS complies with the NCP. It has been streamlined as described in the following section. The remainder of the introduction consists of a discussion of the approach used in development of the FS, including risk management decisions, and an outline of the organization of the FS.

4.0.1 Approach To Feasibility Study

This FS is streamlined as follows to minimize unnecessary evaluation of remedial alternatives for the sites at Point Lay.

 The FS was conducted with the focus on contaminated soil/drums/debris, gravel, soil beneath buildings, and tundra, instead of individual sites.

It is most practical to remediate the sites together because they are small and impacted by similar types of contamination, and the installation is too remote to do otherwise efficiently.

Because the soil underneath both the Garage (SS06) and the module train at the Crushed Drum Area (SS08) are similar, they will be remediated as one site using the same remedial alternative. A small amount of contaminated gravel at the Garage (SS06) is also considered to be associated with this medium. Contaminated tundra is associated with two sites, the Garage (SS06) and the Crushed Drum Area (SS08). The same remedial alternative is recommended for the tundra areas at the two sites.

Repetition of information presented in the RI (Sections 1.0 through 3.0 of this
report) and the Point Lay Risk Assessment is minimized. Data essential to
evaluating remedial alternatives are presented in summary tables in Section 4.1.

- Remedial action characterization tables recommended in the AFCEE Handbook (U.S. Air Force 1991) have been adapted to focus on the data essential to the evaluation of remedial alternatives. Wherever possible, reference is made to the RI and risk assessment for detailed site information, and assumptions used in calculating risk and identifying COCs.
- General response actions (GRAs) and applicable technologies are screened together, and the alternatives are limited to no more than five conventional and innovative methods including the required no action alternative.

4.0.2 Risk Management Decisions

Based on a thorough review of the data, three risk management decisions were made in writing the FS. These decisions are necessary to focus the results of the RI/FS and risk assessment into workable and protective remedial alternatives.

• Surface water in tundra areas has been affected by contamination at the installation. Methods for remediating surface water directly at the sites are not feasible because it is extremely shallow, covers a wide area, is frozen for over half the year, and is intimately associated with tundra. ADEC recognizes that physical remedial actions in tundra are often more ecologically damaging than the petroleum hydrocarbons (Interim Guidance for Non-UST Contaminated Soil Cleanup Levels, Guidance No. 001 - Revision Number 1, July 17, 1991, page 10). Instead of evaluating direct remedial alternatives for surface water in otherwise natural tundra areas, we have taken the approach that remediation of the source will improve the quality of surface water over time.

This risk management decision permits the focus of the FS to be on cleaning up the sources of contamination at the Point Lay radar installation. The primary contaminant in soil/sediment at the installation is DRPH. Other COCs include GRPH, RRPH, BTEX compounds, and PCE.

A second risk management decision relates to the Drainage Pathway from POL Tanks (SS07). The contaminated medium is surface water, and the contaminants are petroleum hydrocarbons (DRPH and GRPH), benzene, dichloroethene, cis-1,2-dichloroethene, trichloroethene, and tetrachloroethene. The recommended action is monitoring of surface water to determine if the contaminants detected in surface water were of a short-term extent (caused by painting the POL tanks), or representative of an ongoing release to the environment.

This site differs from other sites with contaminated surface water in that there is no apparent source to mitigate. The data suggest that the source was a short-term event because contamination appears to be limited to surface runoff (i.e., it is not associated with the soils and sediments). Another round of samples will clarify the situation. If contamination is not detected, no further action should be recommended. If contamination is detected, viable alternatives have been

developed for other sites that could be adjusted to this site. These include institutional controls and monitoring, and an interception trench leading to an oil/water separator and granular activated carbon treatment. The cost for sampling surface water is included in the estimated cost for the recommended alternatives, and is detailed in Attachment A.

A third risk management decision relates to tetrachloroethene detected in soil/sediment at the Garage (SS06). Although tetrachloroethene is identified as a COC in the risk assessment, it is not considered a COC for the purposes of the FS. The maximum concentration detected (43 mg/kg) is significantly less than the concentration that corresponds to an excess cancer risk of 10-4 (the point at which EPA generally requires remediation action). The maximum concentration is also significantly less than the concentration that corresponds to a hazard quotient of 1. Finally, there is no chemical-specific ARAR. The impact of the preferred remedial alternative on tetrachloroethene is included in Section 4.4.5.

4.0.3 Organization

The FS is organized as follows:

- Introduction;
- Site characterization for remediation (considers COCs, range of concentrations detected, estimated areas and volumes of affected media, ARARs, and target cleanup levels or proposed remediation goals for each site);
- Screening of GRAs and presentation of representative remedial technologies;
- Development of remedial alternatives;
- Detailed evaluation of remedial alternatives (the detailed analysis is based on the AFCEE guidance and includes the nine NCP criteria). The detailed evaluation also includes a comparative analysis of alternatives, and identification of preferred alternatives);
- Siting study; and
- Detailed cost estimates and estimates of project duration in attachments A and B, respectively.

4.1 SITE CHARACTERIZATION FOR REMEDIATION

Information relevant to the screening and evaluation of remedial alternatives for the Deactivated Landfill (LF01), Garage (SS06), and Crushed Drum Area (SS08) is summarized in Tables 4-1

through 4-3. The tables include COCs in site soils/sediments, range of concentrations detected, estimates of volumes of affected media, and the basis for listing each as a COC.

4.1.1 Summary of Site Information

The information considered for each site includes:

- medium;
- COCs:
- range of concentrations detected;
- target cleanup level (or proposed remediation goal the lowest applicable action level based on the risk assessment including cancer risk, noncancer HQ, and chemical-specific ARARs);
- basis for the target cleanup level (chemical-specific ARAR, cancer risk or noncancer HQ); and
- design parameters for remedial action.

4.1.2 Estimated Areas, Volumes, and Masses of Contaminated Media

The approximate areas, volumes, and masses of the contaminated media at Point Lay are presented in Table 4-4 for use in the medium-specific approach discussed in the introduction. Areas and depths are estimated based on the RI, and the density is estimated to be 1.8 tons/cubic yard. The locations and estimated volumes of contaminated media are illustrated in Figures 4-1 through 4-3. The media include gravel, soil beneath the two structures (garage and module train), tundra, and soil/drums/debris at the landfill. The estimated total volumes of contaminated media are:

- gravel 45 cubic yards;
- soil beneath buildings 310 cubic yards;
- tundra 2,730 cubic yards; and
- soil/drums/debris 625 cubic yards.

GRAs and remedial alternatives are screened, developed, and evaluated for these media in Sections 4.2 through 4.4.

Estimates of cost and project duration are provided in Attachments A and B, respectively. These attachments are located at the end of Section 4.0.

4.1.3 ARARs

According to the NCP, ARARs must be identified and evaluated to determine all of the requirements for remedial actions. There are three categories of ARARs:

- Chemical-specific;
- Action-specific; and
- Location-specific.

TABLE 4-1. REMEDIAL ACTION CHARACTERIZATION FOR THE DEACTIVATED LANDFILL (LF01)

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IARGEI CLEANUP LEVEL

The concentration of DRPH at this site is barely above the ADEC Non-UST action level. The reason LF01 is considered for remedial action is the list of COCs detected in surface water downstream of the site and migrating from the source area. The COCs and their maximum detected concentrations are: tetrachloroethene (109 µg/L),

GRPH (223 μg/L), benzene (23 μg/L), dichlorfuoromethane (58 μg/L), and trichloroethene (3.3 μg/L). The actual range of contamination at the source. This range reflects contaminations in sediment samples downstream from the Deactivated landfill (LF01) site. The actual range of contamination at the source area has not yet been determined.

Target cleanup level for DRPH in soil is based on ADEC Non-UST guidance and does not necessarily correspond to the final site specific cleanup goal.

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TABLE 4-2. REMEDIAL ACTION CHARACTERIZATION FOR THE GARAGE (SS06)

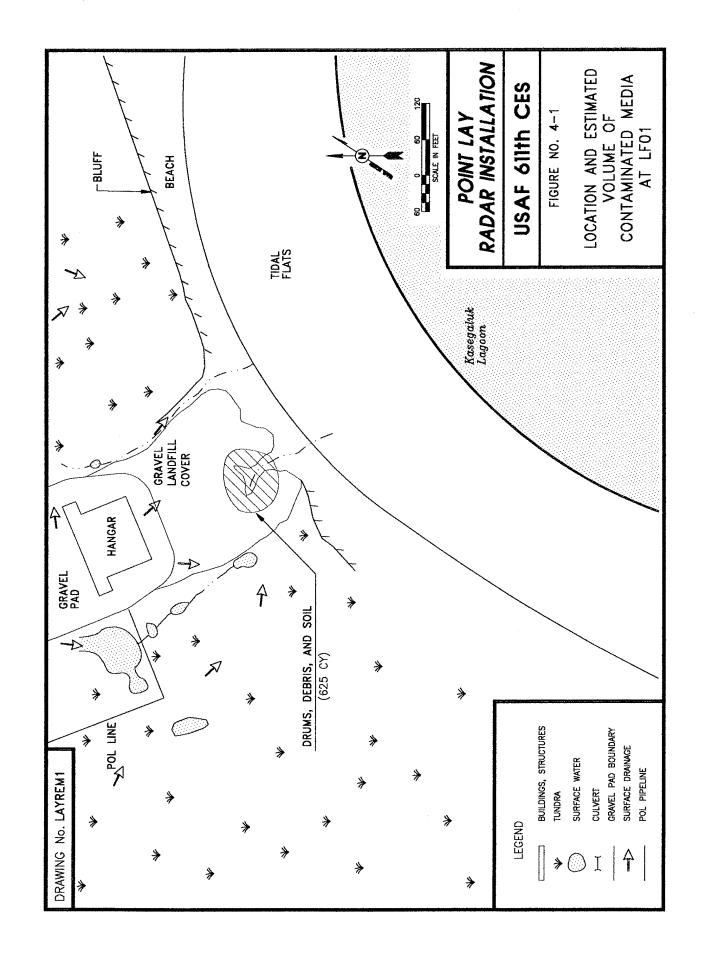
CONTAMINANTS	RANGE OF ENVIRONMENTAL CONTAMINATION	TARGET CLEANUP LEVEL ^a	BASIS FOR LISTING AS COC	VOLUME OF CONTAMINATED MEDIA	DESIGN PARAMETERS
ОЯРН	14.4 - 15,200 mg/kg	500 mg/kg	ADEC Non-UST Action Level	45 cy	microbial activityoxygen diffusioncontaminant
GRРH	0.607 - 937 mg/kg	100 mg/kg	ADEC Non-UST Action Level		concentration • grain size • seasonal impact
ОЯРН	18,000 - 33,400 mg/kg	500 mg/kg	ADEC Non-UST Action Level	150 cy	• accessibility
GRРH	25 - 540 mg/kg	100 mg/kg	ADEC Non-UST Action Level		concentration
яврн	2,300 - 40,000 mg/kg	2,000 mg/kg	ADEC Non-UST Action Level		solubility drainage
втех	ND - 30.8 mg/kg	10 mg/kg	ADEC Non-UST Action Level		
DRPH	ND - 12,800 mg/kg	500 mg/kg	ADEC Non-UST Action Level	2,570 cy	microbial activity
GRРH	ND - 397 mg/kg	100 mg/kg	ADEC Non-UST Action Level		concentration
яярн	ND - 12,000 mg/kg	2,000 mg/kg	ADEC Non-UST Action Level		 soil moisture nutrient levels
втех	ND - 60 mg/kg	10 mg/kg	ADEC Non-UST Action Level		• soil pH
	CONTAMINANTS DRPH GRPH GRPH GRPH GRPH GRPH GRPH GRPH G	AMINANTS	AMINANTS	PANGE OF	RANGE OF ENVIRONMENTAL CONTAMINATION TARGET CLEANUP LEVEL ^a TARGET CLEANUP LEVEL ^a BASIS FOR LISTING AS COC 14.4 - 15,200 mg/kg 500 mg/kg ADEC Non-UST Action Level 18,000 - 33,400 mg/kg 100 mg/kg ADEC Non-UST Action Level 25 - 540 mg/kg 100 mg/kg ADEC Non-UST Action Level ND - 30,8 mg/kg 100 mg/kg ADEC Non-UST Action Level ND - 12,800 mg/kg 2,000 mg/kg ADEC Non-UST Action Level ND - 12,800 mg/kg 100 mg/kg ADEC Non-UST Action Level ND - 12,800 mg/kg 100 mg/kg ADEC Non-UST Action Level ND - 12,800 mg/kg 2,000 mg/kg ADEC Non-UST Action Level ND - 12,000 mg/kg 100 mg/kg ADEC Non-UST Action Level ND - 12,000 mg/kg 100 mg/kg ADEC Non-UST Action Level ND - 12,000 mg/kg 100 mg/kg ADEC Non-UST Action Level

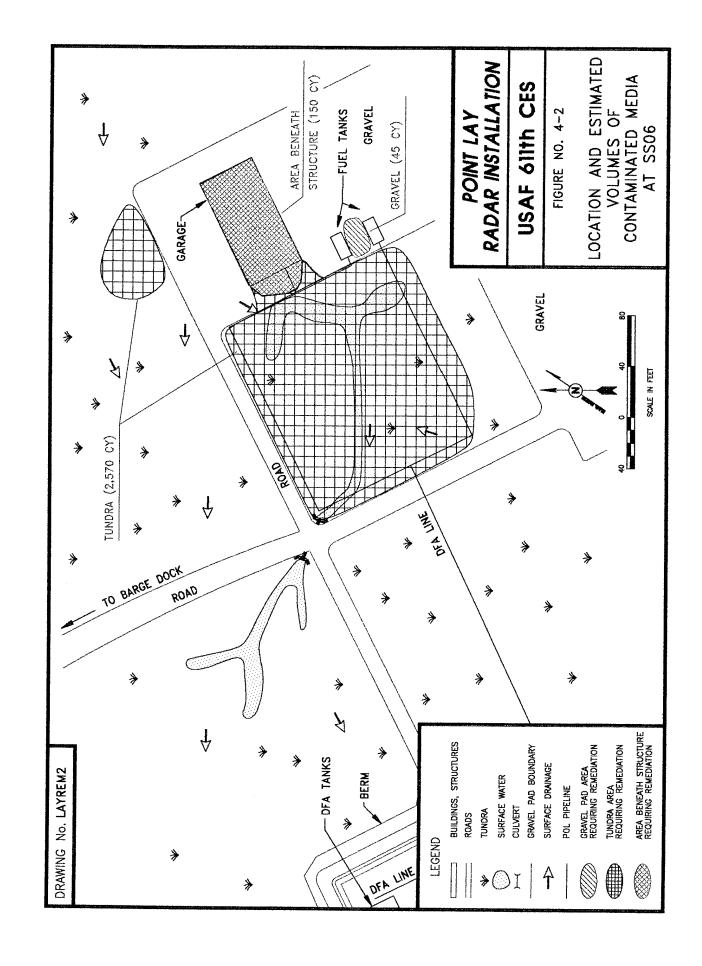
Target cleanup levels for DRPH, GRPH, RRPH, and BTEX in soil are based on ADEC Non-UST guidance and do not necessarily correspond to final site specific cleanup goals.

TABLE 4-3. REMEDIAL ACTION CHARACTERIZATION FOR THE CRUSHED DRUM AREA (SS08)

MEDIA	CONTAMINANTS	RANGE OF ENVIRONMENTAL CONTAMINATION	TARGET CLEANUP LEVEL [®]	BASIS FOR LISTING AS COC	VOLUME OF CONTAMINATED MEDIA	DESIGN PARAMETERS
Soil Underneath	DRPH	10.5 - 17,500 mg/kg	500 mg/kg	ADEC Non-UST Action Level	160 cy	accessibility
Building (soil/gravel)	GRРH	ND - 2,430 mg/kg	100 mg/kg	ADEC Non-UST Action Level		contaminant concentration solubility
	втех	ND - 122.2 mg/kg	10 mg/kg	ADEC Non-UST Action Level		• drainage
Tundra	DRPH	ND - 7,200 mg/kg	500 mg/kg	ADEC Non-UST Action Level	160 cy	microbial activity
(soil/sediment)	GRРH	ND - 550 mg/kg	100 mg/kg	ADEC Non-UST Action Level		contaminant concentration soil moisture
	втех	ND - 37.2 mg/kg	10 mg/kg	ADEC Non-UST Action Level		nutrient levels soil pH
,	Benzene	ND - 1.4 mg/kg	0.5 mg/kg	ADEC Non-UST Action Level		

Target cleanup levels for DRPH, GRPH, BTEX, and benzene in soil are based on ADEC Non-UST guidance and do not necessarily correspond to final site specific cleanup goals.





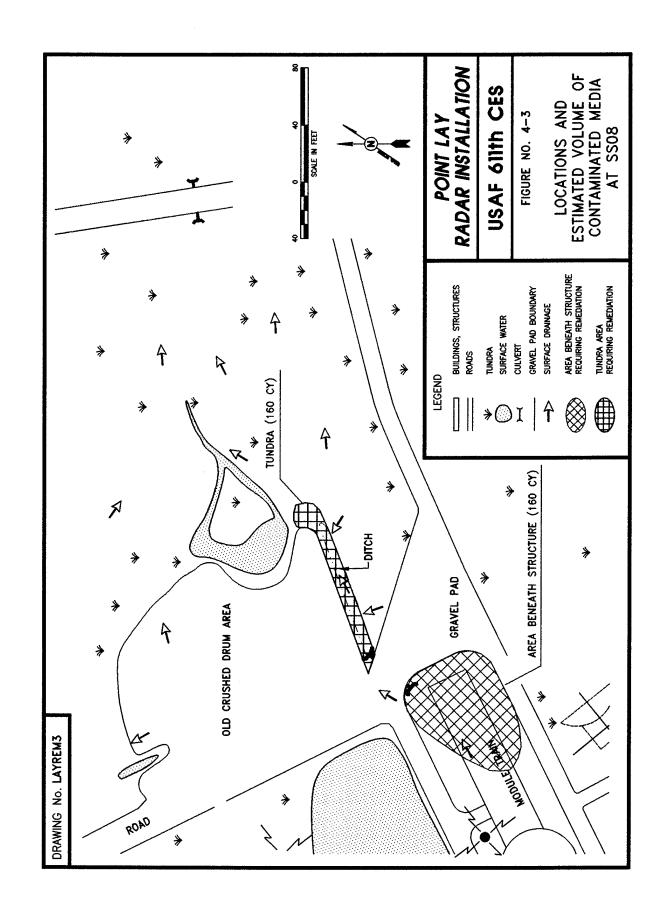


TABLE 4-4. APPROXIMATE AREAS, VOLUMES, AND MASSES OF CONTAMINATED MEDIA BY SITE AT POINT LAY

SITE	MEDIUM	AREA (sq ft)	DEPTH (ft)	VOLUME (cy)	MASS (tons)
Deactivated Landfill (LF01)	soil/drums/debris	5,625	3	625	1,125
Garage (SS06)	gravel	300	4	45	80
	soil beneath building	4,000	1	150	270
	tundra	27,700	2.5	2,570	4,625
Crushed Drum Area (SS08)	soil beneath building	4,400	1	160	290
	tundra	1,730	2.5	160	290

Chemical-specific ARARs are action levels that may apply in addition to risk or hazard-based remediation goals. Chemical-specific ARARs were identified during the RI and included in the risk assessment. The target cleanup levels or proposed remediation goals represent the lowest applicable action level.

Action-specific ARARs are requirements that relate to how remedial actions must be conducted. For example, offsite transportation of hazardous waste must be manifested in compliance with the RCRA requirements.

Location-specific ARARs impose requirements on a remedial action based on the location of the site. For example, there are specific requirements that pertain to wetlands.

It should be noted that ADEC's Interim Guidance for Non-UST contaminated soil target cleanup levels is intended as guidance and does not necessarily correspond to final site-specific cleanup levels. The ARARs for the sites at the Point Lay installation are presented in Table 4-5.

4.2 SCREENING OF GENERAL RESPONSE ACTIONS

4.2.1 Presentation and Screening of General Response Actions

GRAs are general approaches for remedial actions. GRAs can be active or passive measures. Active measures involve removal, active treatment, or isolation of the contaminated media. Passive measures rely on natural processes to reduce the toxicity, mobility, or volume of contamination, or on controls put in place to limit exposure. GRAs apply to contaminants in all of the environmental media separately, or in any combination. Screening GRAs streamlines the FS process by establishing the feasibility of entire classes of remedial responses, thereby enabling the selection of a focused set of viable alternatives for detailed evaluation. GRAs have been evaluated for the four media contaminated at the Point Lay installation: gravel, soil beneath buildings, tundra, and soil/drums/debris.

TABLE 4-5. ARARS FOR SITES AT THE POINT LAY INSTALLATION

YTHORITY	CITATION	TYPE OF ARAR	BASIS	CATEGORY OF ARAR
Clean Air Act	42 U.S.C. 7401-7642, 40 CFR 60, 61, and 63	Action-specific	National Ambient Air Quality Standards (Treatment technology standards for fugitive emissions and landfills)	Applicable
ADEC, Interim Guidance for Non-UST Action Levels	18 AAC 75.140	Chemical-specific	Standards for general guidance	Relevant and Appropriate
RCRA	40 CFR Part 263	Action-specific	Standards Applicable to Generators of Hazardous Waste	Relevant and Appropriate
RCRA	40 CFR 268	Action-specific	Land Disposal Restrictions	Relevant and Appropriate
ADEC, Interim Guidance for Surface and Groundwater Cleanup Levels	AS 46.03.070, AS 46.09.020, 18 AAC 70.020 (b), AS 46.04.020, 18 AAC 75.140, 18 AAC 70.025, 18 AAC 70.030 18 AAC 70.010, and	Location-specific	Standards applicable for water used for drinking and surface water important to the growth and propagation of aquatic life	Relevant and Appropriate
ADEC, Interim Guidance for Surface and Groundwater Cleanup Levels	AS 46.03.070 AS 46.09.020 AS 46.04.020 18 AAC 70.020 18 AAC 75.140	Chemical-specific	Standards applicable for water used for drinking and surface water important to the growth and propagation of aquatic life	Relevant and Appropriate
SDWA	52 FR 25690 56 FR 3526	Chemical-specific	Maximum Contaminant Level for drinking water	Relevant and Appropriate
RCRA	55 FR 30798	Chemical-specific	Standard for Solid Waste Management Units, SWMUs, in the RCRA Corrective Action Program	Relevant and Appropriate

The criteria for screening GRAs are implementability, effectiveness, duration, and cost. Implementability is estimated in terms of technical and administrative barriers. For example, containment is generally less acceptable to regulatory agencies than removal or treatment.

Additionally, an innovative technology that has proven to be effective in the continental U.S. may not be implementable on the North Slope because it cannot be transported there.

Duration is the estimate of the time necessary to attain the treatment efficiency estimated from applicable case studies and the literature. The estimated duration of no action that includes passive biodegradation is long even though the time necessary to implement no action is short.

Effectiveness is the relative success of the response action in reducing contamination and risk to acceptable levels.

Cost is the estimated capital, operating, and administrative costs necessary to attain the projected treatment efficiency. This estimate is presented in relative terms (low, medium, and high).

The GRAs considered for the Point Lay installation are:

- No Action;
- Institutional Controls and Monitoring;
- Containment:
- Onsite Treatment: and
- Removal.

These GRAs are defined as follows:

No Action. Under no action, contaminants are left in place, and only natural processes, such as biodegradation, would lower the concentrations of COCs. No action is considered for all four media.

Institutional Controls and Monitoring. Institutional controls and monitoring represent a passive response in which steps are taken to minimize the possibility of accidental exposure of humans and the environment to COCs. Institutional controls may include fencing off an area to minimize exposure and public education to show people how to avoid exposure. Institutional control of sites contaminated by petroleum hydrocarbons minimizes the chances of accidental exposure while passive biodegradation occurs. Monitoring is included to determine if migration of contaminants is occurring and if natural processes are lowering the concentrations of the COCs.

Containment. Containment limits the potential for accidental exposure to contaminants by physical means. Examples include capping soils and using solidification techniques. Objectives can include one or more of the following: 1) minimize the risk of direct exposure to contaminated soils; 2) eliminate the possibility of contaminants or contaminated soils becoming airborne and migrating; and 3) prevent water from entering the contaminated area and transporting contaminants to other areas.

Onsite Treatment. Treatment may be used to reduce the toxicity, mobility, or volume of a contaminant and may be accomplished in situ or ex situ. In situ treatment involves active treatment with the medium in place. Ex situ treatment involves the removal of the contaminated medium, with subsequent treatment at the installation. The medium may be replaced in the original excavation after treatment. Treatment efficiencies vary depending on the technique used and the type of contaminant present.

Removal. Removal involves excavating the contaminated medium and shipping it offsite for treatment and/or disposal. Removal reduces the risk of exposure to the contaminant because it no longer remains at the installation. There is some risk to remedial workers during the excavation and shipping process.

The applicability of these GRAs at Point Lay was determined using AFCEE screening criteria: implementability, project duration, effectiveness, and cost benefit. Representative technologies for the GRAs retained are presented and screened in Section 4.2.2. Screening was performed as follows.

- **4.2.1.1** Screening of GRAs for Soil, Drums, and Debris. GRAs considered for remediation of the soils, drums, and debris at the Deactivated Landfill (LF01) are presented in Table 4-6. No action, onsite treatment, and removal are retained for evaluation.
- 4.2.1.2 Screening of GRAs for Soil Beneath Buildings and Associated Gravel. Because the volume of gravel is relatively small when compared to the volume of the soil beneath buildings (15 percent), it may be addressed by the same GRAs and technologies. The gravel medium has been combined with soil beneath buildings to streamline the evaluation of remedial alternatives. GRAs considered for remediation of the soil beneath buildings (principally disturbed soil, tundra) and the limited volume of adjacent gravel are presented in Table 4-7. No action, institutional controls and monitoring, containment, and onsite treatment are retained for evaluation.
- **4.2.1.3** Screening of GRAs for Contaminated Tundra. GRAs considered for remediation of tundra are presented in Table 4-8. No action, institutional controls and monitoring, and onsite treatment are retained for evaluation.

4.2.2 Presentation of Technologies

This section describes remedial technologies considered for use at the Point Lay installation based on the retained GRAs. The selected technologies have all been effective in the Alaskan environment. Conditions at Point Lay, including the arctic climate and remote location, exclude many technologies that could be considered for sites in a more temperate location.

SCREENING OF GENERAL RESPONSE ACTIONS FOR REMEDIAL ALTERNATIVES EVALUATED FOR THE SOIL, DRUMS, AND DEBRIS AT DEACTIVATED LANDFILL (LF01) TABLE 4-6.

GENERAL RESPONSE ACTION	REPRESENTATIVE TECHNOLOGIES	PROJECTED TREATMENT EFFICIENCY	RETAINED OR REJECTED	RATIONALE
No action	No action	0 percent*	Retained	Implementability: Low Duration: Short Effectiveness: Low Cost: Low Retained/Rejected: Retained (requirement of NCP).
Institutional controls and monitoring	Monitoring Public education Fencing	0 percent*	Rejected	Implementability: Low Duration: Moderate Effectiveness: Low Cost: Low Retained/Rejected: Rejected due to low implementability and low effectiveness.
Containment	Solidification Capping	90 percent reduction in mobility	Rejected	Implementability: Low Duration: Long Effectiveness: Low Cost: Moderate Retained/Rejected: Rejected due to low implementability, low effectiveness, and long duration.
Onsite treatment	 Thermal desorption 	100 percent	Retained	Implementability: Moderate Duration: Long Effectiveness: High Retained/Rejected: Retained due to moderate implementability and high effectiveness.
Removal	Offsite incineration	100 percent	Retained	Implementability: Moderate Duration: Short to moderate Effectiveness: High Cost: High Retained/Rejected: Retained due to moderate implementability, high effectiveness, and short to moderate duration.

Some attenuation may occur due to dilution or volatilization that is not considered treatment efficiency for the purpose of this FS.

SCREENING OF GENERAL RESPONSE ACTIONS FOR REMEDIAL ALTERNATIVES EVALUATED FOR SOIL BENEATH BUILDINGS AND ASSOCIATED GRAVEL TABLE 4-7.

RATIONALE	Implementability: Moderate Duration: Short project duration, long to achieve bioremediation goals. Effectiveness: Moderate Cost: Low Retained/Rejected: Retained (requirement of NCP).	Implementability: High Duration: Moderate project duration, long to achieve bioremediation goals. Effectiveness: Moderate Cost: Low Retained/Rejected: Retained due to moderate effectiveness, high implementability, and low cost.	Implementability: Moderate Duration: Long Effectiveness: High Cost: Low to Moderate Retained/Rejected: Retained due to high effectiveness, high implementability, and low to moderate cost.	Implementability: Moderate Duration: Short to Long Effectiveness: Moderate to High Cost: Moderate Retained/Rejected: Retained due to moderate implementability and moderate to high effectiveness.	Implementability: Low Duration: Short Effectiveness: High Cost: High Retained/Rejected: Rejected due to low implementability and high cost.
RETAINED OR REJECTED	Retained	Retained	Retained	Retained	Rejected
PROJECTED TREATMENT EFFICIENCY	50 percent	50 percent	90 percent reduction in mobility	90 to 94 percent	100 percent
REPRESENTATIVE TECHNOLOGIES	• No action	Monitoring Public education Fencing	Maintenance of freezing conditions	 Enhanced bioremediation Biosurfactants 	Offsite incineration
GENERAL RESPONSE ACTION	No action	Institutional controls and monitoring	Containment	Onsite treatment	Removal

TABLE 4-8. SCREENING OF GENERAL RESPONSE ACTIONS FOR REMEDIAL ALTERNATIVES EVALUATED FOR TUNDRA

GENERAL RESPONSE ACTION	REPRESENTATIVE TECHNOLOGIES	PROJECTED TREATMENT EFFICIENCY	RETAINED OR REJECTED	RATIONALE
No action	No action	50 percent	Retained	Implementability: Moderate Duration: Short project duration long to achieve bioremediation goals. Effectiveness: Moderate Cost: Low Retained/Rejected: Retained (requirement of NCP).
Institutional controls and monitoring	Monitoring Public education Fencing	50 percent	Retained	Implementability: High Duration, long to achieve bioremediation goals. Effectiveness: Moderate Cost: Low Retained due to high implementability, moderate Retained due to high implementability, moderate effectiveness, and low cost.
Containment	Solidification Capping	80 percent reduction in mobility	Rejected	Implementability: Moderate Duration: Long Effectiveness: Low Cost: Moderate Retained/Rejected: Rejected due to moderate implementability, low effectiveness, and long duration.
Onsite treatment	 Enhanced bioremediation 	94 percent	Retained	Implementability: High Duration: Short to Long Effectiveness: Moderate to High Cost: Moderate Retained/Rejected: Retained due to high implementability and moderate to high effectiveness.
Removal	Offsite incineration	100 percent	Rejected	Implementability: Low Duration: Short to Moderate Effectiveness: High Cost: High Retained/Rejected: Rejected due to low implementability and high cost.

The remedial technologies under consideration for the contaminated media at the Point Lay radar installation are presented in this section as follows:

No Action

No action

Institutional Controls and Monitoring

Institutional controls and monitoring (i.e., monitoring, public education, fencing)

Containment

Containment by maintenance of freezing conditions

Onsite Treatment

- Thermal desorption
- Biosurfactants
- Enhanced bioremediation

Removal

Offsite incineration

All of the technologies presented above have been applied effectively at sites on the North Slope or elsewhere in Alaska. In addition to being effective in cold climates, they are well-suited to the short summer season, the only favorable time for outdoor remedial activities, and the remote location where there is little or no staffing for year-round operation and maintenance of remedial systems. Specifically, these remedial technologies are either short-term actions completed in one season (approximately 100 days) with imported labor, or longer term actions that are self-sustaining and require minimal labor.

Several of the retained remedial technologies involve bioremediation, which can be accomplished on the North Slope with psychrophilic (i.e., cold weather) microorganisms and fungi, both indigenous and imported. Bioremediation has been documented on the North Slope and elsewhere in Alaska, but is subject to several limiting factors including:

- availability of nutrients and oxygen;
- short periods of thaw; and
- percentage of fine-grained materials.

Biodegradation can generally be estimated in terms of first order kinetics, where the only rate limiting factor is the biodegradation potential, which is a function of the factors listed above. With first order kinetics, a given target cleanup level will eventually be reached regardless of the initial concentration; however, as the gap between initial and target concentrations widens or rate

limiting factors become more significant, the time necessary to reach the target increases exponentially because the function plots symptomatically with concentration. A more detailed discussion of the estimates of biodegradation is presented in Section 4.4.

Descriptions of the selected technologies that have been retained are presented in the following subsections.

- **4.2.2.1 No Action**. No action is a required alternative of the NCP, the purpose of which is to provide a baseline for assessment of other alternatives. No action consists of passive bioremediation at sites where COCs are biodegradable. Natural unassisted bioremediation typically takes longer than assisted enhanced bioremediation. The rate of biodegradation, especially in the North Slope region, is reduced because of short warm seasons and prolonged harsh winters.
- **4.2.2.2 Institutional Controls and Monitoring**. This technology involves no active treatment; taking advantage instead of the natural biodegradation that occurs in arctic soil (Atlas 1985). Natural bioremediation typically takes longer than enhanced bioremediation. The rate of biodegradation, especially in the North Slope region, is reduced because of short warm seasons and prolonged harsh winters. Public education and fencing off the affected area would constitute institutional controls, and monitoring would include sampling and analysis of any associated surface water and soil/sediment.

Institutional controls and monitoring are being evaluated for the petroleum-related contaminants in gravel, tundra, and soil beneath buildings. The case studies used to support biodegradation-based alternatives are used to estimate rates of bioremediation.

- 4.2.2.3 Containment by Maintenance of Freezing Conditions (Containment). The contaminated soil beneath the structures at the Garage (SS06) and the Crushed Drum Area (SS08) represents a difficult remedial problem because the Air Force does not intend to raze the structures at this time. The vertical access is insufficient to manually remove the contaminated soil or to use equipment to do so. Attempts to flush the contamination introduce issues related to the control of runoff and the potential loss of structural integrity of the piles on which the structures rest due to melting of permafrost. The latter may not be the primary concern because the piles are set very deeply. One solution is to maintain freezing conditions under the buildings year round to keep contaminants locked in ice or frozen ground. The undersides of the structures are relatively cold year round because they remain shaded during the summer. Examples of cold containment include insulation with gravel cover and heat exchangers (or a combination of the two). Once the building is dismantled, the contaminated soil can be excavated and managed appropriately. The containment alternative is not appropriate for the associated contaminated gravel pad at the Garage (SS06) site.
- **4.2.2.4 Thermal Desorption**. One of the technologies under the onsite treatment GRA is thermal desorption. This technology involves moderate temperature treatment (200-500°F) of the contaminated media. Contaminants are not destroyed, but are instead vaporized, condensed, then collected. If the condensed material is prohibited from land disposal under 40 CFR 268, it must be treated to meet the treatment standards for hazardous wastes, which in this

case is incineration. Thermal desorption may be conducted onsite. Condensed liquids that are restricted from land disposal must be sent offsite for incineration at a RCRA permitted facility. There may be difficulties in treating bulky materials, such as drums and debris, therefore, those must be segregated before treatment. Figure 4-4 is the process flow diagram of excavation, thermal desorption, and offsite incineration.

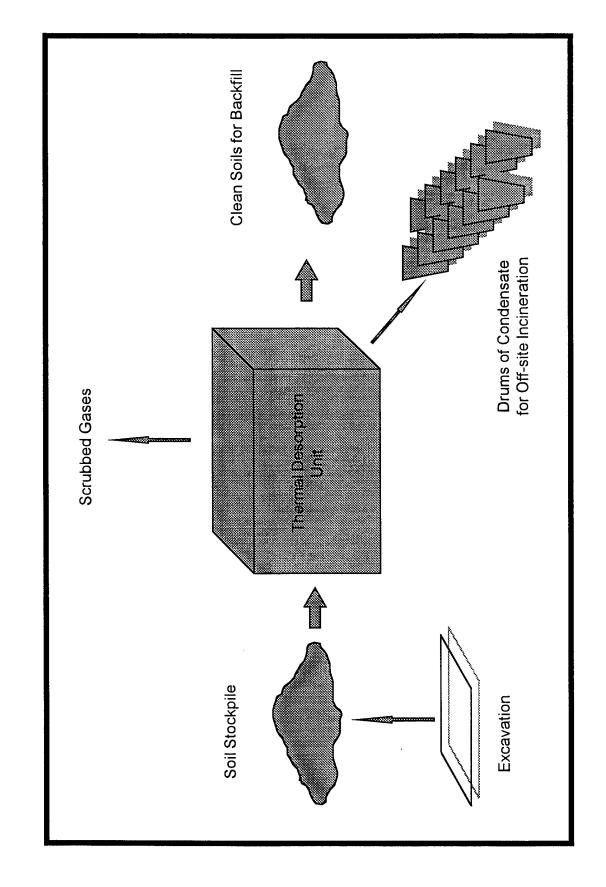
4.2.2.5 Enhanced Bioremediation. One of the technologies under the onsite treatment GRA is enhanced bioremediation. Enhanced bioremediation in this FS involves delivering water and nutrients to the contaminated soils in place to assist natural bioremediation. Several organisms that can utilize the carbon in petroleum are indigenous to the North Slope, including Bacillus cereus, Bacillus polymixa, Arthrobacter globiformis, and Alcaligenes poradoxus (Ratcliff 1993). In addition, several strains of pseudomonas bacteria (psychrophilic genera) decreased TPH concentration in tundra during the summer season in the Prudhoe Bay area (Jorgenson et al. 1992). A case study conducted at Point Thompson, Alaska suggests that this approach is feasible for remediation of gravel pads if a cultured population of microbes is used (Liddell et al. 1991). The cultured population could be either indigenous or exotic. A treatability study will be necessary to determine how best to bioremediate each of the media.

Variations in temperature affect the rate of biodegradation by bacteria. In the arctic environment, bacteria remain active enough to consume petroleum hydrocarbon molecules from June through August when temperatures are warmest. Successful biodegradation of petroleum hydrocarbon contaminants in soil by indigenous bacteria is possible at the ambient arctic summer temperatures (Evans, Elder, and Hoffman 1992). A study at Surfcote Pad in the Prudhoe Bay area (Evans, Elder, and Hoffman 1992) indicates that native microbial populations are capable of bioremediating diesel-contaminated gravel at an appreciable rate during the short summer season. In the arctic environment at a depth of three feet, microbial populations can effectively consume hydrocarbon products (Atlas 1985); however, the number and activity of bacteria decrease with an increase in depth because of lower temperatures and reduced levels of oxygen and nutrients.

Enhanced bioremediation is being evaluated for the soil beneath the buildings and for open tundra. Oxygenated water that has been warmed to offset the cold and nutrients may be applied to contaminated soil beneath buildings to provide conditions necessary for bioremediation. In the open tundra, the water does not need to be warmed because heat is provided by the sun. Water and nutrients would be added intermittently based on the results of a treatability study. This process may not generate runoff. Nonetheless, a wastewater discharge permit may be required. Precautions will also be taken to contain any runoff that occurs. Figure 4-5 is a process flow diagram of enhanced bioremediation.

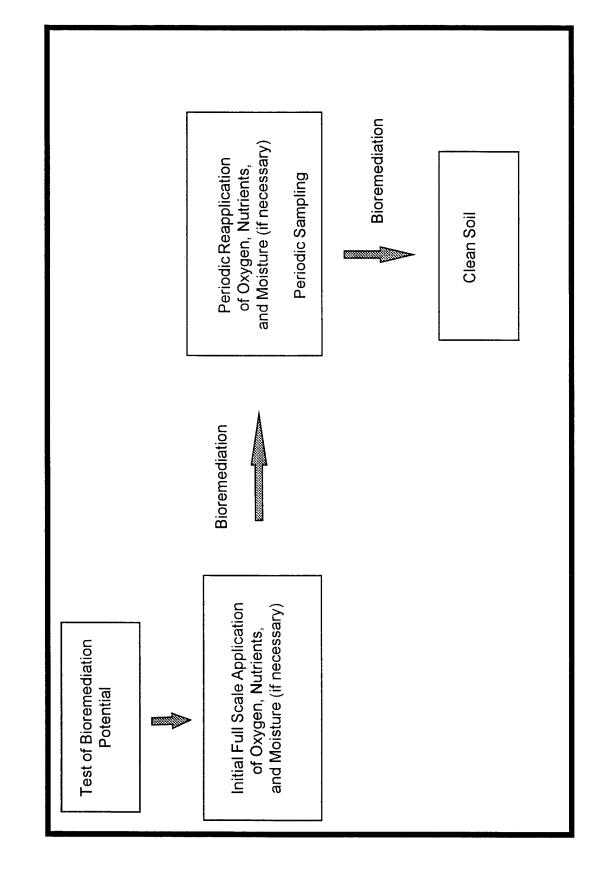
4.2.2.6 Biosurfactants. One of the technologies under the onsite treatment GRA is biosurfactants. Biosurfactants have been used to remove hydrocarbons from contaminated soils and gravels. Biosurfactants are products of bacterial fermentation, and may include sugars, fats, and proteins. They act by attaching to and surrounding hydrocarbon molecules thus detaching them from soil particles. Biosurfactants do not alter the structure of the hydrocarbons, but render them temporarily inert, preventing them from reattaching to soil particles and allowing their removal from soils by flushing with water. The flush water mixture is then collected and the

Figure 4-4: Thermal Desorption and Off-Site Incineration Process Flow Diagram



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Figure 4-5: Enhanced Bioremediation Process Flow Diagram



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biosurfactant-hydrocarbon mixture, which floats on water, is removed by skimming. The collected mixture is bioremediated onsite in an aerated tank spiked with nutrients.

This technology is being evaluated for treating DRPH, GRPH, RRPH, and BTEX in the soil beneath buildings that is difficult to remediate in traditional ways. It is readily available in Alaska, and involves using high intensity "air knives" to jet the biosurfactant into the material being remediated. It is anticipated from the results of the site investigations that contamination beneath the Garage and module train is limited to a very shallow depth (<1 foot bgs) by permafrost close to the surface. The "air knives" can probably penetrate far enough to mobilize all of the contaminants. After the biosurfactant is applied, the medium will be flushed with water to remove the mix of hydrocarbons and surfactant. The flush water mixture will be collected from existing drainage pathways and pumped to a tank or series of drums for bioremediation. Recirculation will keep the volume of water low. Figure 4-6 is a process flow diagram of the biosurfactants technology.

4.2.2.7 Offsite Incineration. The technology considered in this FS under the removal GRA is offsite incineration. This technology involves removal and high temperature treatment of the contaminated media. It is being evaluated for the soil/drums/debris at the Deactivated Landfill (LF01). Contaminants are transformed into non-hazardous combustion byproducts, mostly water and carbon dioxide. Additional byproducts are non-combustible materials in the media including metallic debris. Incineration of regulated waste is performed at an appropriate RCRA permitted facility.

4.3 DEVELOPMENT OF REMEDIAL ALTERNATIVES

4.3.1 Approach to Developing Remedial Alternatives

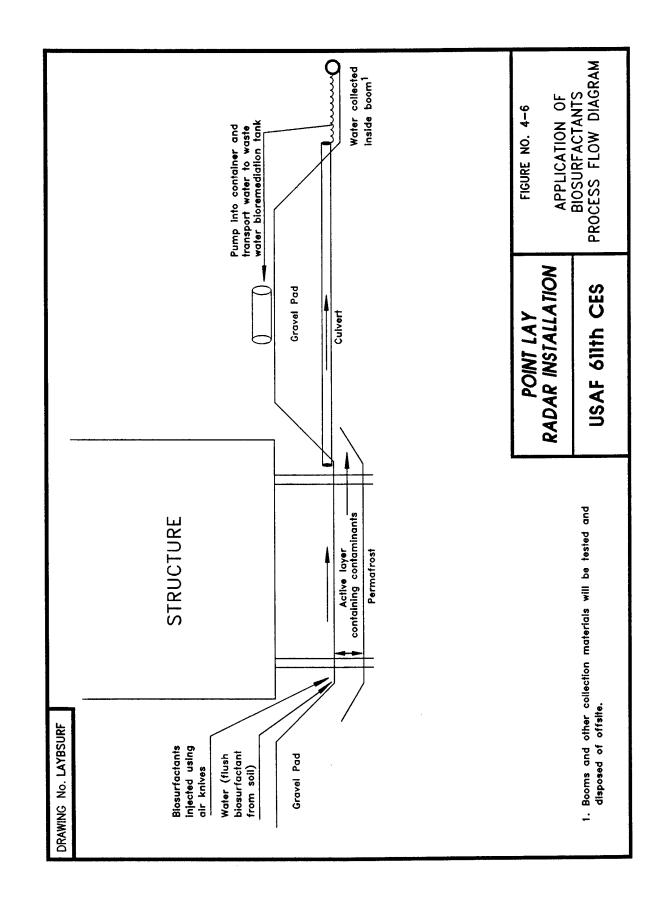
The remedial technologies selected in Section 4.2.2 represent the GRAs retained in Section 4.2.1. In this section remedial technologies are developed into alternatives designed to address site-specific COCs. Because the alternatives are designed around the combined media (e.g., soil beneath buildings), rather than specific sites, one remedial technology is sufficient to define an alternative that can be applied to different sites. Alternatives developed in this section are evaluated in the detailed evaluation of remedial alternatives in Section 4.4, and evaluated with respect to the NCP's nine criteria in Section 4.4.4.

This section is organized by remedial alternative; the rationale for development and a list of applicable sites and media are included. Remedial alternatives are summarized in Table 4-9 at the end of the section. The technologies are described in Section 4.2 and are not discussed further in this section.

4.3.1.1 No Action.

Rationale for Development. No action provides a baseline against which other alternatives are compared. It is a required alternative according to the NCP. Natural attenuation of petroleum

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TABLE 4-9. SUMMARY OF REMEDIAL ALTERNATIVES BY MEDIUM

MEDIA	SITES	REMEDIAL ALTERNATIVES
Soil, drums, and debris	Deactivated Landfill (LF01)	No action Thermal desorption Offsite incineration
Soil beneath buildings and associated gravel	Garage (SS06) Crushed Drum Area (SS08)	No action Institutional controls and monitoring Containment ^a Enhanced bioremediation Biosurfactants
Tundra	Garage (SS06) Crushed Drum Area (SS08)	No action Institutional controls and monitoring Enhanced bioremediation

Containment applies to soil beneath buildings only. The remedial alternative for the small volume of associated gravel would be institutional controls and monitoring.

hydrocarbons will occur through biodegradation if microbial populations and conditions (e.g., water, oxygen, temperature, and nutrients) are present that facilitate aerobic biodegradation.

Applicable Media and Sites.

- Soil, drums, and debris: Deactivated Landfill (LF01).
- Soil beneath buildings and associated gravel: Garage (SS06) and Crushed Drum Area (SS08).
- Tundra: Garage (SS06) and Crushed Drum Area (SS08).

4.3.1.2 Institutional Controls and Monitoring.

Rationale for Development. This limited action alternative is applicable to all of the media because currently the COCs do not pose a significant cancer risk or noncancer hazard. Natural attenuation of petroleum hydrocarbons may occur through biodegradation if microbial populations and conditions (e.g., water, oxygen, temperature, and nutrients) are present that facilitate aerobic biodegradation.

Institutional controls considered include public education and fencing off the affected area. Monitoring would be performed periodically to ensure that contaminants are biodegrading and are not migrating offsite, and that the quality of surface water where surface water contamination has been observed is improving.

Applicable Media and Sites.

- Soil beneath buildings and associated gravel: Garage (SS06) and Crushed Drum Area (SS08)
- Tundra: Garage (SS06) and Crushed Drum Area (SS08)

4.3.1.3 Containment.

Rationale for Development. The soil beneath the buildings at the Garage (SS06) and the Crushed Drum Area (SS08) pose several technical problems because the Air Force has no immediate plans to dismantle the buildings. Vertical access is insufficient for conventional excavation. Containment by maintenance of freezing conditions could be an effective way to prevent the migration of contaminants until the building is dismantled or a highly effective remedial technology becomes available. Human exposure would be very limited because of the low vertical clearance. Several methods exist for maintaining freezing conditions beneath buildings in arctic climates. Methods include insulation, heat exchangers, or a combination of the two. This alternative applies to soil beneath the buildings only. Monitoring will verify the effectiveness of the remediation action.

The associated gravel at the Garage (SS06) site would not be contained in this manner. Instead, because of its small volume, institutional controls and monitoring would be employed as the remedial alternative. Monitoring would be concurrent with monitoring of the contained soils beneath the buildings.

Applicable Media and Sites.

• Soil beneath the buildings at the Garage (SS06) and Crushed Drum Area (SS08)

4.3.1.4 Enhanced Bioremediation.

Rationale for Development. This is a low maintenance method for reducing petroleum concentrations in tundra, soils beneath buildings, and associated gravel. Enhanced bioremediation in this FS is assisted (i.e., enhanced natural bioremediation). The assistance is low level, and includes the addition of appropriate amounts of nutrients, lime, and moisture, and the assumption that sufficient oxygen is present to support aerobic metabolism of hydrocarbons. This alternative is more aggressive than natural, unassisted attenuation, yet can be designed to limit disturbance of the tundra and permafrost. A treatability study will be necessary to demonstrate site-specific viability of this alternative. For example, the percentage of fine-grained soils in the associated gravel will affect its ability to retain moisture and organic carbon.

Monitoring will verify the progress of the process.

Applicable Media and Sites.

- Soil beneath buildings and associated gravel: Garage (SS06) and Crushed Drum Area (SS08).
- Tundra: Garage (SS06) and Crushed Drum Area (SS08).

4.3.1.5 Biosurfactants.

Rationale for Development. This method worked for removing petroleum hydrocarbons from shallow soils, hard surfaces, and rocks following the Valdez oil spill. It is applicable to soils beneath buildings and associated gravel. Use of biosurfactants is also feasible for the small volume of gravel associated with the Garage (SS06) because the runoff can be contained. Alternatively, the gravel could be excavated, treated using biosurfactants, and replaced.

Monitoring will verify the effectiveness of the remedial action.

Applicable Media and Sites.

• Soil beneath buildings and associated gravel: Garage (SS06) and Crushed Drum Area (SS08).

4.3.1.6 Thermal Desorption.

Rationale for Development. This alternative will significantly reduce the amount of material to be incinerated by liquefying and removing contaminants from the soil, drums, and debris. Thermally desorbed soil would be reintroduced to the excavation. This alternative includes offsite incineration of the condensate from the thermal desorption process at a facility permitted under RCRA to treat wastes regulated by land disposal restrictions (40 CFR 268). Mobile thermal desorption units can be transported to Point Lay.

Applicable Medium and Sites.

Soil, drums, and debris: Deactivated Landfill (LF01)

4.3.1.7 Offsite Incineration.

Rationale for Development. This alternative will result in the physical removal of contaminated soil/sediment to an offsite incinerator for destruction. This is an established treatment for wastes regulated by the land disposal restrictions (40 CFR Part 268) such as spent tetrachloroethene, which is an F-listed solvent under RCRA (40 CFR Part 261.31).

Applicable Media and Sites.

Soil, drums, and debris: Deactivated Landfill (LF01).

4.4 DETAILED EVALUATION OF REMEDIAL ALTERNATIVES

4.4.1 Approach

The alternatives developed in Section 4.3 are evaluated in this section using the suggested criteria in the AFCEE Guidance for remedial alternative evaluation. These five criteria are defined in Sections 4.4.1.1 through 4.4.1.5. The detailed evaluation of alternatives is conducted in Section 4.4.2 and summarized in Section 4.4.3. The alternatives are evaluated with respect to NCP's nine criteria in Section 4.4.4. Preferred alternatives are presented in Section 4.4.5.

- **4.4.1.1** Successful Application Of The Technology Under Site Conditions. This criterion requires the location and approximate date of the applications, the managing entity, and a presentation of successful applications of the given alternative under conditions similar to those found at the Point Lay installation. Case studies conducted on the Alaskan North Slope are used to the extent possible.
- **4.4.1.2 Total Project Cost**. The total cost of performing the remedial alternative is estimated and divided into technology testing, capital, total labor, operating, environmental testing, closure, and indirect costs.

For the purpose of this evaluation, the itemized cost elements are defined as follows:

- Technology testing costs consist of pilot tests or treatability studies;
- Capital costs include equipment or materials purchased;
- Total labor costs include the labor required for operating and maintaining the remedial action system, oversight, project management, and development of planning documents;
- Operating costs include costs other than labor associated with operating remedial systems (e.g., thermal desorption) and earth moving;
- Environmental testing costs are for sampling and analysis, including periodic monitoring, and monitoring associated with site closure; and
- Closure costs related to reporting associated with site closure.
- **4.4.1.3 Contaminant Reduction**. The reduction in concentration of each COC may be projected for each medium and site based on case-study derived efficiencies. This reduction, referred to as post-remedial concentration, is listed with the initial concentration and target cleanup level. Post-remedial concentration is a more useful measure of the effectiveness than risk reduction for the remedial alternatives at the Point Lay installation as none of the COCs are included because of elevated cancer risk or noncancer hazard. Risks or hazards, therefore, are not the indicators of successful remediation. Post-remedial concentration is applicable to target cleanup concentrations set by regulations and/or cleanup guidance.

The concentrations presented in this section are defined as follows:

Initial Concentration. This is the maximum initial concentration of the COC detected.

Target Cleanup Level. This is the cleanup level specified for the given COC (the basis for which is presented in Tables 4-1 to 4-3).

Post Remedial Concentration. This is the estimated final concentration of the COC based on remedial efficiencies from case studies. References to these case studies can be found in Sections 4.4.2.1 through 4.4.2.3, subsection A, successful applications of alternatives. Estimated remedial efficiencies presented apply to all organic COCs for thermal desorption and biosurfactants. For enhanced bioremediation, institutional controls and monitoring, and no action, the estimated remedial efficiencies are based on DRPH. Specific estimated efficiencies used are presented below. The estimates are independent of time (over the short term, e.g., one year, natural biodegradation would be significantly less efficient than active remedial alternatives like offsite incineration).

The following remedial efficiencies are used for detected petroleum hydrocarbons and the assumed source of COCs in surface water (listed in a footnote to Table 4-1) at the Deactivated Landfill (LF01) at the Point Lay installation:

- Biosurfactants 90 percent
- Thermal Desorption 100 percent
- Offsite Incineration 100 percent

The following remedial efficiencies are used for DRPH, GRPH, RRPH, and BTEX compounds at the Point Lay installation:

- Institutional controls and monitoring; and no action 50 percent (Natural unassisted bioremediation)
- Enhanced bioremediation 94 percent (depending on the range of boiling points of the hydrocarbons in the RRPH present at these sites and the class of compound, RRPH could biodegrade similarly or more slowly than DRPH)

The post-remedial concentration is estimated using the following formula:

Post-remedial Concentration = Initial Concentration x (1 - Remedial Efficiency)

4.4.1.4 Project Duration. The estimated duration of each of the remedial alternatives and associated project schedules is an important consideration because of the seasonal limitations on outdoor work and the lack of personnel to perform operation and maintenance activities in this remote location. The North Slope of Alaska is frozen and covered with snow and ice for the majority of the year, leaving a period of only approximately 100 days in the summer when the weather is favorable for outdoor work, especially remedial alternatives involving excavation and flowing water. Outdoor phases of remedial actions significantly longer than 100

days must be suspended until the following summer, causing a marked increase in duration because of the extended winter down time. In order to maximize efficiency, remedial alternatives were designed either to complete outdoor phases of remediation within this narrow time frame or extend over a longer term and require only minimal labor.

Project durations are based on case studies from Alaska. The rates of biological degradation for enhanced bioremediation and natural unassisted bioremediation associated with no action institutional controls and monitoring are expressed as a decay function. The first-order decay function used to model this biological degradation is $C = C_0 e^{-kt}$ (C is final concentration, C_0 is the initial concentration.

The rate constant, k, is estimated based on related case studies. In general, the k-values presented reflect the lower end of the expected range of values. These values are then downwardly adjusted because of the arctic environment conditions. The lowest rates are associated with no action and institutional controls and monitoring because there is no enhancement of conditions. Enhanced bioremediation has the highest rate because more factors are optimized. The following constants and criteria were used for estimation of remedial rates:

DRPH Reduction

No action and institutional controls and monitoring k = 0.0025/day (Natural unassisted bioremediation)

The k-value for no action and institutional controls and monitoring is based on rate data from a control cell in an experiment to measure the effectiveness of enhanced bioremediation (Liddell et al. 1991). The case study k-value was decreased in an attempt to offset the bias that aeration of the control cell introduces.

Enhanced bioremediation

k = 0.008/day

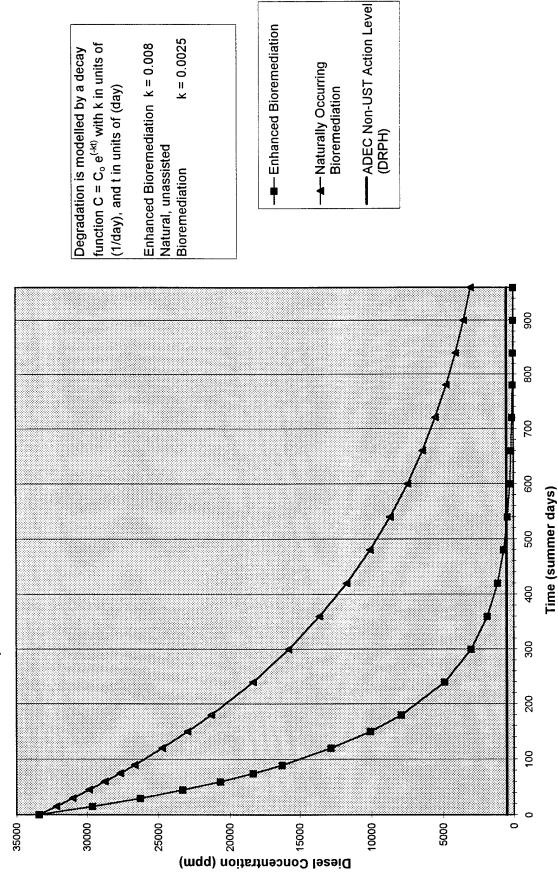
This rate is based on a number of case studies, and represents a downward adjustment of the low end of the range of decay constants observed. Many of the case studies took place under temperate climatic conditions.

A comparison of the predicted degradation of DRPH using the three bioremedial technologies being evaluated is illustrated in Figure 4-7 (no action and institutional controls and monitoring are both represented by natural unassisted bioremediation).

The duration of onsite remedial activity and the total project duration are presented in Attachment B. These durations are defined as follows:

 Duration of onsite remedial activity includes all onsite activities related to conducting the remedial action: sampling, operating remedial equipment, time required for adding nutrients to soil, mobilization, and demobilization (this is a quantification of the relative duration estimate).

(Basis: Maximum Diesel Concentration of 33,400 ppm at Point Lay) Figure 4-7. Comparative Biodegradation of Diesel Fuel in Soils



k = 0.0025

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- Total project duration includes the duration of onsite remedial activity, as well as time required for preparing planning documents, conducting permitting activities, and closure.
- **4.4.1.5 Data Gaps**. Data gaps include any environmental testing or treatability studies that must be done to determine the effectiveness of a given remedial alternative under site conditions.

Alternatives are analyzed comparatively in Sections 4.4.3 and 4.4.4 based on the AFCEE criteria above, and the nine criteria in the NCP, respectively. The preferred remedial alternatives are identified in Section 4.4.5.

4.4.2 Detailed Evaluation of Alternatives for Soil, Drums, and Debris; Soil Beneath Buildings; and Tundra

This section presents a detailed evaluation of remedial alternatives for soil, drums, and debris; soil beneath buildings; and tundra.

4.4.2.1 Soil, Drums, and Debris.

Alternatives considered for treatment of the soil, drums, and debris at the Deactivated Landfill (LF01) at Point Lay are:

- No action;
- Thermal desorption; and
- Offsite incineration.

A. Successful Applications of Alternatives

No Action. The landfill is a source for downstream contamination. This is a finite source, so contamination should diminish as the source is depleted. Contaminants, however, may be released for many years.

Thermal Desorption. Thermal desorption is an established method for removing volatile organics from soils. Mobile units currently exist with the capability of removing petroleum hydrocarbons, solvents, and chlorinated hydrocarbons. One unit successfully reduced tetrachloroethene concentrations in soil from 1,200 ppm to less than 0.025 ppm (Anderson 1993). It may be difficult to thermally desorb debris-laden soil because most mobile units use a screwauger type conveyor.

Offsite Incineration. This is an established method for destroying contamination. Incineration is Best Demonstrated Available Technology (BDAT) for treatment of F-listed wastes required under the land disposal restrictions (40 CFR 268). Contaminant reduction by this alternative exceeds 99 percent. There are a number of RCRA permitted incinerators operating in the lower 48 states.

B. Project Costs

Table 4-10 is a summary of project costs for remedial alternatives evaluated for contaminated soil, drums, and debris at the Deactivated Landfill (LF01). Detailed cost estimates for each remedial alternative are in Attachment A.

C. Contaminant Reduction

The degree to which COCs will meet target cleanup levels (proposed remediation goals) for each alternative is summarized in Table 4-11. This measure is presented as post remedial concentration, and is a function of the initial concentration and the projected efficiency.

D. Project Duration

A breakdown of the project durations for the remedial alternatives being considered for soil, drums, and debris at the Deactivated Landfill (LF01) is shown in Table 4-12. Detailed project duration tables for each of the remedial alternatives evaluated for the source area at the Deactivated Landfill (LF01) are located in Attachment B.

E. Data Gaps

No Action. There are no data gaps.

Thermal Desorption. The data gap is the lack of knowledge on the type and degree of contamination in the source area (i.e., number and contents of buried drums), especially with regard to the COCs detected in downstream surface water.

Offsite Incineration. The data gap listed for thermal desorption also applies to this alternative.

- **4.4.2.2** Soil Beneath Buildings and Associated Gravel. Alternatives considered for treatment of the disturbed soils beneath buildings and associated gravel at Point Lay are:
 - No action:
 - Institutional controls and monitoring;
 - Containment;
 - Enhanced bioremediation; and
 - Biosurfactants.

A. Successful Applications of Alternatives

No Action. As part of a study on bioremediation of DRPH-contaminated gravel pads and soils near Prudhoe Bay, a control cell was left unassisted and untreated. This control cell was, in essence, natural attenuation. Initial DRPH concentration was approximately 1,900 mg/kg. After nine weeks the DRPH concentration had decreased to 1,200 mg/kg. This indicates a reduction of 37 percent in DRPH concentration in 63 days. In addition, a slight increase in the microbial population was noted (Liddell et al. 1991).

SUMMARY OF PROJECT COSTS FOR REMEDIAL ALTERNATIVE EVALUATED FOR THE SOIL, DRUMS, AND DEBRIS AT THE DEACTIVATED LANDFILL (LF01) **TABLE 4-10.**

\$0 \$0 \$0 \$0			OPERALING	ENVIRONMENTAL TESTING	CLOSURE COST	ADMINISTRATIVE AND OTHER INDIRECT COSTS	PRESENT VALUE
\$7.500 \$29.190 \$753.285 \$1.587.590	\$	\$	0\$	0\$	\$5,000	\$750	\$5,750
	0 \$29,190	\$753,285	\$1,587,590	\$1,400	\$5,000	\$953,585	\$3,337,545
Offsite Incineration \$0 \$11,350 \$148,320 \$2,404,100 \$0 \$5,		\$148,320	\$2,404,100	0\$	\$5,000	\$1,028,065	\$3,598,235

TABLE 4-11. ESTIMATED CONTAMINANT REDUCTION FOR REMEDIAL ALTERNATIVES EVALUATED FOR THE SOILS DRUMS, AND DEBRIS AT THE DEACTIVATED LANDFILL (LF01)

REMEDIAL ACTION	CONTAMINANTS	INITIAL CONCENTRATION	TARGET CLEANUP LEVELS	POST REMEDIAL CONCENTRATION
No action	DRPH	624 mg/kg*	500 mg/kg	312 mg/kg
Thermal desorption	DRPH	624 mg/kg	500 mg/kg	0
Offsite incineration	DRPH	624 mg/kg	500 mg/kg	0

^{*} The principal reason for taking remedial action at The Deactivated Landfill is that it is assumed materials in the landfill are the source of COCs in surface water (listed in a footnote to Table 4-1). Both thermal desorption and offsite incineration would reduce the COCs to target cleanup levels.

TABLE 4-12. ESTIMATED PROJECT DURATION FOR REMEDIAL ALTERNATIVES EVALUATED FOR THE SOIL, DRUMS, AND DEBRIS AT THE DEACTIVATED LANDFILL (LF01)

REMEDIAL ALTERNATIVE	DURATION OF ONSITE REMEDIAL ACTIVITY (Days)	TOTAL PROJECT DURATION (Days)
No action	0	30
Thermal desorption	321	501
Offsite Incineration	37	157

Institutional Controls and Monitoring. The bioremediation study noted above applies to this remedial alternative.

Containment. Although there are no examples of maintaining freezing conditions to contain contaminants on the North Slope, the method has been developed as an innovative technology in the lower 48 states, and the low maintenance approaches of insulation and heat exchangers are routinely used in Alaska to protect the integrity of structures by keeping the level of permafrost at or near the ground surface.

Enhanced Bioremediation. Enhanced bioremediation has been successfully implemented in the arctic environment to treat petroleum hydrocarbon contamination on the North Slope. Studies at Point Thompson and Kuparuk oil fields in Alaska show that enhanced bioremediation is a successful and efficient method for reducing the concentration of petroleum hydrocarbons to a desired level within a relatively short time. The Point Thompson case study shows that 16,000

cubic yards of TPH-contaminated gravel with an initial concentration of 2,000 to 3,000 ppm was bioremediated to an average concentration of 285 ppm between July and September 1990 (Liddell et al. 1991).

The estimated remedial action efficiency of enhanced bioremediation is 94 percent based on case studies in Alaska and estimates of biodegradation kinetics.

Biosurfactants. Biosurfactants were used successfully in cleaning petroleum from rocks and underlying sands and soils in the Prince William Sound area in 1993 (PES 1993). They also were used successfully in cleaning hydrocarbon contamination from rocks and soils at a refinery in Kenai, Alaska in 1992 (Tesoro/PES 1992). Specific North Slope case studies have not been identified, but the site conditions, especially the shallow permafrost beneath the structures and existing drainage, should allow for easy collection of any materials introduced by this process. A wastewater discharge permit may be required.

The estimated remedial action efficiency for the biosurfactants is 90 percent, based on the reduction found in a case study done at the Tesoro Kenai Refinery (Tesoro/PES 1992) and consideration of the uncertainty in this application of the technology. This efficiency should be possible under conditions found on the North Slope; however, a treatability test will be conducted to determine site-specific efficiency.

B. Project Costs

A summary of project costs is included in Table 4-13. Detailed cost estimates for each remedial alternative are located in Attachment A.

C. Contaminant Reduction

The degree to which the concentrations of COCs will meet target cleanup levels (proposed remediation goals) for each alternative is summarized in Table 4-14.

D. Project Duration

A breakdown of the project durations for the remedial alternatives being considered for the soils beneath buildings at the Point Lay installation is shown in Table 4-15. Project durations are based on the assumption that, in the case of enhanced bioremediation, COC reduction to target levels will occur within three years of the start of the project or show through periodic monitoring a clear trend in that direction. This clear trend will justify site closure even if the target cleanup levels have not been met. The target cleanup levels for DRPH, RRPH, GRPH, and BTEX, again, are based on guidance and are negotiable with ADEC. Case studies cited support this approach.

A similar approach is taken for institutional controls and monitoring. In this case, it is assumed that natural, unassisted biodegradation of COCs will show a clear trend towards the target cleanup level based on periodic sampling that will justify site closure within three years.

SUMMARY OF PROJECT COSTS FOR REMEDIAL ALTERNATIVE EVALUATED FOR SOIL BENEATH BUILDINGS AND ASSOCIATED GRAVEL **TABLE 4-13.**

REMEDIAL ALTERNATIVE	TECHNOLOGY TESTING	CAPITAL	TOTAL LABOR	OPERATING COST	ENVIRONMENTAL TESTING	CLOSURE	ADMINISTRATIVE AND OTHER INDIRECT COSTS	PRESENT VALUE
No action	0\$	0\$	0\$	0\$	0\$	\$5,000	092\$	\$5,750
Institutional controls and monitoring	0\$	\$100	\$29,320	\$17,375	\$2,330	\$4,320	\$14,850	\$68,290
Containment	0\$	096'6\$	\$61,340	\$43,325	\$2,330	\$0	\$30,560	\$147,545
Biosurfactants	\$7,500	\$71,920	\$64,910	\$38,050	\$1,680	\$5,000	\$47,265	\$236,325
Enhanced bioremediation	\$7,500	\$4,420	\$76,505	\$43,325	\$1,745	\$4,320	\$35,330	\$173,140

TABLE 4-14. ESTIMATED CONTAMINANT REDUCTION FOR SOIL BENEATH BUILDINGS AND ASSOCIATED GRAVEL

SITE	REMEDIAL ACTION	CONTAMINANTS	INITIAL CONCENTRATION (mg/kg)	TARGET CLEANUP LEVELS (mg/kg)	POST REMEDIAL CONCENTRATION (mg/kg)
Garage (SS06)	No action	DRPH	33,400	200	16,700
and Crushed Drum Area (SS08)		Нанр	2,430	100	1,215
		ВВРН	40,000	2,000	20,000
		втех	122	10	61
	Institutional controls and	Нана	33,400	200	16,700
	monitoring	GRРН	2,430	100	1,215
		RRPH	40,000	2,000	20,000
		втех	122	10	61
	Containment	Нава	33,400/15,200 ^a	200	33,400/7,600 ^b
		GRРН	2,430/937 ^a	100	2,430/469 ^b
		RRPH	40,000/NDª, ^d	2,000	40,000/NA ^{b,c}
		втех	122/NA ^c	10	122/NA ^{b,c}
	Biosurfactants	ОЯРН	33,400	200	3,340
		GRРH	2,430	100	243
		яврн	40,000	2,000	4,000
		втех	122	10	12
	Enhanced bioremediation	ОЯРН	33,400	200	2,004
		GRРН	2,430	100	146
		яврн	40,000	2,000	2,400
		втех	122	10	7

The first concentration relates to soils beneath buildings. Since containment involves no treatment, the post remedial concentration is the same as the initial concentration. The second concentration The first concentration is a 0 percent reduction that corresponds to containment of soils beneath buildings. The second concentration is a 50 percent reduction that corresponds to gravel addressed relates to the gravel and the remedial action efficiency of institutional controls and monitoring.

by institutional controls and monitoring. Not applicable because the initial concentration is below target cleanup level, therefore, no remediation action is required. ND - Not detected.

4-47

TABLE 4-15. ESTIMATED PROJECT DURATION FOR REMEDIAL ALTERNATIVES EVALUATED FOR SOIL BENEATH BUILDINGS AND ASSOCIATED GRAVEL

REMEDIAL ALTERNATIVE	DURATION OF ONSITE REMEDIAL ACTIVITY (Days)	TOTAL PROJECT DURATION (Days)
No action	0	30
Institutional controls and monitoring	13	881
Containment	33	841
Biosurfactants	21	201
Enhanced bioremediation	, 30	988

Project duration for no action involves closure reporting only. Detailed project duration tables for each of the alternatives considered for this medium are located in Attachment B.

E. Data Gaps

No Action. There are no data gaps.

Institutional Controls and Monitoring. The data gap is the lack of information on the biodegradation potential.

Containment. The data gaps relate to design specifications including the most appropriate method for maintaining freezing conditions and the method for accessing the undersides of the structures at the Garage (SS06) and Crushed Drum Area (SS08).

Biosurfactants. There are no data gaps. The accessibility to soils beneath the buildings is a concern.

Enhanced Bioremediation. The data gap is the lack of information on the biodegradation potential. A treatability study will be necessary to determine the biodegradation potential of contaminants in this medium.

4.4.2.3 Tundra. Alternatives considered for treatment of tundra at Point Lay are:

- No action;
- Institutional controls and monitoring; and
- Enhanced bioremediation.

A. Successful Applications of Alternatives

No Action. See no action discussion in successful applications of alternatives for soil beneath buildings and associated gravel, Section 4.4.2.2 (page 4-43).

Institutional Controls and Monitoring. See no action discussion in successful applications of alternatives for soil beneath buildings and associated gravel, Section 4.4.2.2 (page 4-43).

Enhanced Bioremediation. See enhanced bioremediation for soil beneath buildings and associated gravel for discussion of successful applications, Section 4.4.2.2 (page 4-43).

B. Project Costs

A summary of project costs is included in Table 4-16. Detailed cost estimates for each remedial alternative are located in Attachment A.

C. Contaminant Reduction

The degree to which concentrations of COCs will meet target cleanup levels (proposed remediation goals) for each alternative is summarized in Table 4-17.

D. Project Duration

Estimated project durations are summarized in Table 4-18. The assumptions about project duration mirror those for soil beneath buildings. Detailed project duration estimates for each of the alternatives are located in Attachment B.

E. Data Gaps

No Action. There are no data gaps.

Institutional Controls and Monitoring. The data gap is the lack of information on biodegradation potential.

Enhanced Bioremediation. The lack of information on biodegradation potential and acceptable disturbance of tundra are the data gaps. A treatability study is necessary to determine the biodegradation potential of contaminants in tundra. Discussions with ADEC will clarify acceptable limits to disturbing the tundra.

4.4.3 Summary of Detailed Evaluation of Remedial Alternatives

Tables 4-19 through 4-21 summarize the remedial alternatives evaluated by site for soil, drums, and debris; soil beneath buildings and associated gravel; and tundra, respectively. Costs presented in the tables are based on the detailed cost sheets in Attachment A.

TABLE 4-16. SUMMARY OF PROJECT COSTS FOR REMEDIAL ALTERNATIVES EVALUATED FOR TUNDRA

REMEDIAL ALTERNATIVE	TECHNOLOGY TESTING	CAPITAL COST	TOTAL LABOR	OPERATING COST	ENVIRONMENTAL TESTING	CLOSURE COST	ADMINISTRATIVE AND OTHER INDIRECT COSTS	PRESENT VALUE
No action	0\$	\$0	0\$	0\$	0\$	\$5,000	092\$	\$5,750
Institutional controls and monitoring	\$0	\$100	\$29,320	\$17,325	\$1,000	\$4,320	\$14,040	\$66,145
Enhanced bioremediation	\$7,500	\$5,305	\$76,505	\$43,325	\$1,165	\$4,320	\$35,390	\$173,510

TABLE 4-17. ESTIMATED CONTAMINANT REDUCTION FOR TUNDRA

SITE	REMEDIAL ACTION	CONTAMINANTS	INITIAL CONCENTRATION (mg/kg)	TARGET CLEANUP LEVEL (mg/kg)	POST REMEDIAL CONCENTRATION (mg/kg)
Garage (SS06)	No action	DRPH	7,300	500	3,650
and Crushed Drum Area		GRPH	420	100	210
(SS08)		RRPH	7,000	2,000	3,500
		втех	37	10	19
	Institutional	DRPH	7,300	500	3,650
	controls and monitoring	GRPH	420	100	210
		RRPH	7,000	2,000	3,500
		втех	37	10	19
	Enhanced	DRPH	7,300	500	438
	bioremediation	GRPH	420	100	25
		RRPH	7,000	2,000	420
		BTEX	37	10	2

TABLE 4-18. ESTIMATED PROJECT DURATION FOR REMEDIAL ALTERNATIVES EVALUATED FOR TUNDRA

REMEDIAL ALTERNATIVE	DURATION OF ONSITE REMEDIAL ACTIVITY (Days)	TOTAL PROJECT DURATION (Days)
No action	0	30
Institutional controls and monitoring	13	881
Enhanced bioremediation	30	988

TABLE 4-19. SUMMARY OF REMEDIAL ALTERNATIVES EVALUATED FOR THE DEACTIVATED LANDFILL (LF01)

MEDIUM	REMEDIAL ACTION	CONTAMINANTS	REMEDIAL ACTION EFFICIENCY	INITIAL	TARGET CLEANUP LEVEL	POST REMEDIAL CONCENTRATION (#9/L)	BENCH OR TREATABILITY STUDY REQUIRED	LEVEL OF WORKER PROTECTION	PROJECT	PROJECT DURATION (Months)
Sediment	Sediment No action	DRPH	50 percent	624 mg/kg ^b	500°	315	ON	٥	5,750	-
	Thermal desorption	ОВРН	100 percent	624 mg/kg ^b	500°	-	YES	Q	3,337,545	17
	Offsite incineration	ОЯРН	100 percent	624 mg/kg ^b	500°	7	NO	D	3,598,235	9

The initial concentration reflects contaminant concentration in sediment downstream of the LF01 site. Actual range of contamination at the source area has not yet been

It is assumed that the source includes potential COCs which have not yet been detected in the soil, drums, or debris but were detected in downstream surface water at maximum concentrations listed in a footnote to Table 4-1. The remedial action efficiencies apply to these potential COCs as well as DRPH and have no effect on other

criteria in the table. Target cleanup level for DRPH in soil is based on ADEC Non-UST guidance and does not necessarily correspond to final site-specific cleanup goals.

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TABLE 4-20. SUMMARY OF REMEDIAL ALTERNATIVES EVALUATED FOR SOILS BENEATH BUILDINGS AND ASSOCIATED GRAVEL

PROJECT DURATION (Months)	-				83				62				7				33			
PROJECT	\$5,750				\$68,290				147,545				\$236,325				\$173,140			
LEVEL OF WORKER PROTECTION	۵				۵				Ω				O				٥			
BENCH OR TREATABILITY STUDY REQUIRED	ON				ON.				O _N				YES				YES			
POST REMEDIAL CONCENTRATION (mg/kg)	16,700	1,215	20,000	61	16,700	1,215	20,000	61	33,400/7,600	2,430/469	40,000/NA ^{b,c}	122/NA ^{b,c}	3,340	243	4,000	12	2,004	146	2,400	7
TARGET CLEANUP LEVEL (mg/kg)	500	100	2,000	10	500	100	2,000	10	200	100	2,000	10	500	100	2,000	10	200	100	2,000	10
INITIAL CONCENTRATION (mg/kg)	33,400	2,430	40,000	122	33,400	2,430	40,000	122	33,400/15,200 ^b	2,430/937 ^b	40,000/ND ^{b,d}	122/NA	33,400	2,430	40,000	122	33,400	2,430	40,000	122
REMEDIAL ACTION EFFICIENCY	20%	20%	20%	20%	20%	20%	20%	20%	90/50%ª	90/50%ª	90/20% ^a	₈ %05/06	%06	%06	%06	%06	94%	94%	94%	94%
CONTAMINANTS	ОЯРН	GRРH	яврн	втех	рврн	GRРН	RRPH	втех	DRPH	СВРН	яврн	втех	DRPH	GRРH	ВВРН	втех	DRPH	GRРН	ВВРН	втех
REMEDIAL	No action				Institutional	controls and monitoring			Containment				Biosurfactants				Enhanced	bioremediation		
SITE	Garage	(SS06) and Crushed	Drum Area (SS08)	Ì																

90 percent refers to reduction in contaminant mobility in soils beneath buildings. Since containment does not reduce contaminant concentrations, the 90 percent is not factored into post remedial concentration. 50 percent refers to gravel addressed by institutional controls and monitoring.

The first concentration relates to soils beneath buildings. Since containment involves no treatment, the post remedial concentration is the same in as initial concentration. The second concentration relates to the gravel and the 50 percent remedial action efficiency of institutional controls and monitoring

Not applicable because the initial concentration is below the target cleanup level, therefore no remedial action is required.

ND - not detected.

TABLE 4-21. SUMMARY OF REMEDIAL ALTERNATIVES EVALUATED FOR TUNDRA

SITE	Garage	(SS06) and Crushed	Drum Area	(2222)	1							
REMEDIAL ACTION	No action				Institutional	controls and monitoring	•		Enhanced	bioremediation		
CONTAMINANTS	рврн	GRРH	яврн	втех	рврн	GRРH	ВВРН	втех	рврн	GRРH	ВВРН	втех
REMEDIAL ACTION EFFICIENCY	20%	20%	20%	20%	20%	20%	%09	%09	%76	94%	%46	94%
INITIAL CONCENTRATION (mg/kg)	12,800	550	12,000	09	12,800	550	12,000	09	12,800	550	12,000	09
TARGET CLEANUP LEVEL (mg/kg)	200	100	2,000	10	200	100	2,000	10	500	100	2,000	10
POST REMEDIAL CONCENTRATION (mg/kg)	6,400	275	9000	30	6,400	275	6,000	30	768	33	720	4
BENCH OR TREATABILITY STUDY REQUIRED	O _N				8				YES			
LEVEL OF WORKER PROTECTION	۵				۵				۵			
PROJECT	\$5,750				\$66,145				\$173,510			
PROJECT DURATION (Months)	~				59				33			

4.4.4 Summary of the Nine Criteria

This section consists of an evaluation of the proposed alternatives. The alternatives are arranged by medium with reference to specific sites where it is appropriate, and will be analyzed according to the following nine criteria required in the NCP:

- Overall protection of human health and the environment;
- Compliance with ARARs;
- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility, or volume through treatment;
- Short-term effectiveness;
- Implementability;
- Cost:
- State acceptance (not evaluated at this time); and
- Community acceptance (not evaluated at this time).

State acceptance and community acceptance will be based on comments on the RI/FS report that will detail the proposed remedial alternative for each site.

The evaluation of the nine criteria is presented in Tables 4-22 through 4-24 for soil, drums, and debris; soils beneath buildings and associated gravel; and tundra. The following definitions of the nine criteria, taken from the EPA RI/FS Guidance Document and the NCP, are used.

Overall Protection of Human Health and the Environment. This criterion addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

Compliance With ARARs. This criterion addresses whether or not a remedy will meet all of the ARARs of federal and state environmental statutes and/or provide grounds for invoking a waiver.

Long-Term Effectiveness and Permanence. This criterion refers to the ability of a remedy to maintain reliable protection of human health and the environment over time once cleanup goals have been met.

Reduction of Toxicity, Mobility, or Volume Through Treatment. This criterion is the anticipated performance of the treatment technologies a remedy may employ (reflects the anticipated performance of treatment).

Short-Term Effectiveness. This criterion addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

Implementability. This criterion is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

TABLE 4-22. EVALUATION OF NINE CRITERIA FOR THE DEACTIVATED LANDFILL (LF01)

<u> S</u>	SITE: Deactivated Landfill (LF01)	No Action	Thermal Desorption	Offsite Incineration
<u> </u>	Overall Protection of Human Health and the Environment	This alternative may not be completely protective of human health and the environment because it does not comply with all chemical-specific ARARs. Therefore, it may not provide sufficient long-term effectiveness and permanence.	This alternative is protective of human health and the environment because it complies with all ARARs, provides longterm effectiveness and permanence, and provides short-term effectiveness.	This alternative is protective of human health and the environment because it complies with all ARARs, provides longterm effectiveness and permanence, and provides short-term effectiveness.
Ni Ni	. Compliance with ARARs	The use of this technology will comply with action specific and location specific ARARs, but may not provide enough reduction to comply with chemical specific ARARs.	The use of this technology will comply with all chemical specific, action specific, and location specific ARARs.	The use of this technology will comply with all chemical specific, action specific, and location specific ARARs.
<u> </u>	Long-Term Effectiveness and Permanence	This alternative may not provide long- term effectiveness because with no source removal, contamination of downstream tundra and the lagoon will continue.	This atternative provides sufficient long- term effectiveness because the residual COC concentrations are below relevant risk and hazard levels and are below relevant action levels. It provides permanence because COCs are removed from the contaminated medium.	This atternative provides sufficient long- term effectiveness because the residual COC concentrations are below relevant risk and hazard levels, and are below relevant action levels. It provides permanence because COCs are removed from the contaminated medium.
4	. Reduction of Toxicity, Mobility, and Volume Through Treatment	Results in a reduction in volume of DRPH through natural biodegradation.	Results in a reduction in volume of DRPH and COCs through treatment.	Results in a reduction in volume of DRPH and COCs through treatment.
က်	. Short-Term Effectiveness	This alternative will not detrimentally affect on environment, the surrounding community, or workers.	This alternative will not detrimentally affect the environment, the surrounding community, or workers. Recommended worker protection is level D.	This atternative will not detrimentally affect the environment, the surrounding community, or workers. Recommended worker protection is level D.
	6. Implementability	This alternative is probably not administratively implementable though it is technically implementable based on the COCs detected in downstream surface water.	Technical implementability will be determined by performing a treatability study. Administrative implementability issues includes securing permits and siting the thermal desorption unit, which may be done in the hangar. Vendors are readily available.	This technology is technically implementable. Administrative implementability issues include securing permits, and siting of staging area, which should be possible at the hangar area. Vendors are readily available.
	7. Cost	\$5,750	\$3,337,543	\$3,598,236
الستيا	8. State/Support Agency	ADEC will be involved in review and selection of remedial alternatives.	ADEC will be involved in review and selection of remedial alternatives.	ADEC will be involved in review and selection of remedial atternatives.

TABLE 4-22. EVALUATION OF NINE CRITERIA FOR SOURCE AREA AT LF01 (CONTINUED)

SITE:	SITE: Deactivated Landfill (LF01)	No Action	Thermal Desorption	Offsite Incineration
٥	9 Committing Acceptance	Community Belations Plan is being	Community Relations Plan is being	Community Relations Plan is being
§ •		implemented and community concerns	implemented and community concerns	implemented and community concerns
		will be addressed in responsiveness	will be addressed in responsiveness	will be addressed in responsiveness
		summary.	summary.	summary.

EVALUATION OF NINE CRITERIA FOR SOIL BENEATH BUILDINGS AND ASSOCIATED GRAVEL AT THE GARAGE (SS06) AND CRUSHED DRUM AREA (SS08) **TABLE 4-23.**

	<u> </u>		T		
Containment	This alternative is protective of human health and the environment as a temporary measure as long as freezing conditions are maintained.	This afternative complies with action-specific and locationspecific ARARs. It does not comply with chemical-specific ARARs.	This alternative does not provide long term effectiveness or permanence. It is intended to be a temporary measure.	Results in no reduction in toxicity through treatment.	This alternative will present no detrimental effect on the environment or surrounding area. Workers may be exposed to COCs and difficult working conditions beneath the Garage.
Enhanced Bioremediation	This alternative is probably completely protective of human health and the environment. It does not comply with all chemical specific ARARs at the points of maximum COC concentration but does when concentrations are averaged over the site. Therefore, it probably provides sufficient long-term effectiveness and permanence.	The use of this technology will comply with all action specific and location specific ARARs and probably provide enough reduction to comply with all chemical specific ARARs if average site concentrations are used.	This alternative may not provide sufficient long-term effectiveness because some residual COC concentrations are above relevant action levels.	Results in a reduction in toxicity through treatment.	This alternative will not detrimentally affect the environment, the surrounding community, or workers. Recommended worker protection is level D.
Biosurfactants	This alternative is probably completely protective of human health and the environment. It does not comply with all chemical specific ARARs at the points of maximum COC concentration but does when concentrations are averaged over the site. Therefore, it probably provides sufficient long-term effectiveness and permanence.	The use of this technology will comply with all action specific and location specific ARARs and probably provide enough reduction to comply with all chemical specific ARARs if average site concentrations are used.	This alternative may not provide sufficient long-term effectiveness because some residual COC concentrations are above relevant action levels.	Results in a reduction in volume through treatment.	This alternative will not detrimentally affect the environment, the surrounding community, or workers. Recommended worker protection is level C, since the biosurfactants may act as irritants.
Institutional Controls and Monitoring	This alternative is probably completely protective of human health and the environment. It does not comply with all chemical specific ARARs at the points of maximum COC concentration but does when concentrations are averaged over the site. Therefore, it probably provides sufficient long-term effectiveness and permanence.	The use of this technology will comply with all action specific and location specific ARARs and probably provide enough reduction to comply with all chemical specific ARARs if average site concentrations are used.	This alternative may not provide sufficient long-term effectiveness because some residual COC concentrations are above relevant action levels.	Results in a reduction in toxicity through natural biodegradation.	This alternative will not detrimentally affect the environment, the surrounding community, or workers. Recommended worker protection is level D.
No Action	This alternative is probably completely protective of human health and the environment. It does not comply with all chemical specific ARARs at the points of maximum COC concentration but does when concentrations are averaged over the site. Therefore, it probably provides sufficient long-term effectiveness and permanence.	The use of this technology will comply with all action specific and location specific ARARs and probably provide enough reduction to comply with all chemical specific ARARs if average site concentrations are used.	This alternative may not provide sufficient long-term effectiveness because some residual COC concentrations are above relevant action levels.	Results in a reduction in toxicity through natural biodegradation.	This alternative will not detrimentally affect the environment, the surrounding community, or workers.
Criterion	1. Overall Protection of Human Heatth and the Environment	2. Compliance with ARARs	3. Long-Term Effectiveness and Permanence	4. Reduction of Toxicity, Mobility, and Volume Through Treatment	5. Short-Term Effectiveness

EVALUATION OF NINE CRITERIA FOR SOIL BENEATH BUILDINGS AND ASSOCIATED GRAVEL AT THE GARAGE (SS06) AND CRUSHED DRUM AREA (SS08) (CONTINUED) **TABLE 4-23.**

Criterion	No Action	Institutional Controls and Monitoring	Biosurfactants	Enhanced Bioremediation	Containment
6. Implementability	This alternative could be technically and administratively implementable, provided that a risk management decision is made that COC concentrations do not warrant monitoring.	This alternative is technically and administratively implementable.	Technical implementability will be determined by performing a treatability study. Administrative implementability issues include securing permits and difficulties with application under structures. Materials are readily available.	Technical implementability will be determined by performing a treatability study. Administrative implementability issues include securing permits and difficulties with application under structures. Materials are readily available.	This alternative should be technically and administratively implementable.
7. Cost	\$5,750	\$68,290	\$236,325	\$173,140	\$147,545
8. State/Support Agency	ADEC will be involved in review and selection of remedial alternatives.	ADEC will be involved in review and selection of remedial alternatives.	ADEC will be involved in review and selection of remedial atternatives.	ADEC will be involved in review and selection of remedial alternatives.	ADEC will be involved in review and selection of remedial alternatives.
9. Community Acceptance	Community Relations Plan is being implemented and community concerns will be addressed in responsiveness summary.	Community Relations Plan is being implemented and community concerns will be addressed in responsiveness summary.	Community Relations Plan is being implemented and community concerns will be addressed in responsiveness summary.	Community Relations Plan is being implemented and community concerns will be addressed in responsiveness summary.	Community Relations Plan is being implemented and community concerns will be addressed in a responsiveness summary.

TABLE 4-24. EVALUATION OF NINE CRITERIA FOR TUNDRA AT THE GARAGE (SS06) AND CRUSHED DRUM AREA (SS08)

Enhanced Bioremediation	This alternative is protective of human health and the environment because it complies with all ARARs, provides long-term effectiveness and permanence, and provides short-term effectiveness.	The use of this technology will comply with all chemical specific, action specific, and location specific ARARs.	This alternative provides sufficient long-term effectiveness because the residual COC concentrations are below relevant risk and hazard levels, and are below relevant action levels. It provides permanence because COCs are removed from the contaminated medium.	Results in a reduction in toxicity through treatment.	This alternative will not detrimentally affect the environment, the surrounding community, or workers. Recommended worker protection is level D.	Technical implementability will be determined by performing a treatability study. Administrative implementability issues include securing permits. Materials are readily available.	\$173,510	ADEC will be involved in review and selection of remedial alternatives.	Community Relations Plan is being implemented and community concerns will be addressed in responsiveness summary.
Institutional Controls and Monitoring	This alternative is probably completely protective of human health and the environment. It does not comply with all chemical specific ARARs at the points of maximum COC concentration but does when concentrations are averaged over the site. Therefore, it probably provides sufficient long-term effectiveness and permanence.	The use of this technology will comply with all action specific and location specific ARARs and probably provide enough reduction to comply with all chemical specific ARARs if average site concentrations are used.	This alternative may not provide sufficient long-term effectiveness because some residual COC concentrations are above relevant action levels.	Results in a reduction in toxicity through natural biodegradation.	This alternative will not detrimentally affect the environment, the surrounding community, or workers. Recommended worker protection is level D.	This alternative is administratively implementable.	\$66,145	ADEC will be involved in review and selection of remedial alternatives.	Community Relations Plan is being implemented and community concerns will be addressed in responsiveness summary.
No Action	This alternative is probably completely protective of human health and the environment. It does not comply with all chemical specific ARARs at the points of maximum COC concentration but does when concentrations are averaged over the site. Therefore, it probably provides sufficient long-term effectiveness and permanence.	The use of this technology will comply with all action specific and location specific ARARs and probably provide enough reduction to comply with all chemical specific ARARs if average site concentrations are used.	This alternative may not provide sufficient long-term effectiveness because some residual COC concentrations are above relevant action levels.	Results in a reduction in toxicity through natural biodegradation.	This alternative will not detrimentally affect the environment, the surrounding community, or workers.	This alternative should be technically and administratively implementable, provided that a risk management decision is made that COC concentrations do not warrant monitoring.	\$5,750	ADEC will be involved in review and selection of remedial atternatives.	Community Relations Plan is being implemented and community concerns will be addressed in responsiveness summary.
Criteria	Overall Protection of Human Health and the Environment	2. Compliance with ARARs	3. Long-Term Effectiveness and Permanence	4. Reduction of Toxicity, Mobility, and Volume	5. Short-Term Effectiveness	6. Implementability	7. Cost	8. State/Support Agency	9. Community Acceptance

Cost. Cost includes estimated capital and operation and maintenance costs, and net present work costs.

State Acceptance. State acceptance addresses the technical or administrative issues and concerns the support agency may have regarding each alternative.

Community Acceptance. Community acceptance addresses the issues and concerns the public may have regarding each of the alternatives.

4.4.5 Preferred Alternatives

The preferred alternatives for the media at the four sites are presented in Table 4-25. The preferred alternative for the source area at the Deactivated Landfill (LF01) is to excavate the material and transport it offsite for incineration. This alternative is more flexible then thermal desorption because in general its effectiveness is independent of the medium, including soil, drums, liquids, and debris. Offsite incineration would also be less impacted in terms of project duration by an increase in volume, concentration, or variety of material characteristics. Thermal desorption is less effective than offsite incineration with drums and debris. Thermal desorption requires treatability testing for application to soils and gravels because excessive moisture or fine-grained materials can severely reduce its effectiveness. In general, offsite incineration requires a much shorter duration than thermal desorption (given the assumed treatment rate of four tons/day), and may have greater community acceptance because there are no air emissions or hazards that are associated with long-term onsite treatment. In addition, offsite incineration is comparable in cost to thermal desorption (assuming the cost of incineration does not increase).

TABLE 4-25. PREFERRED REMEDIAL ACTION ALTERNATIVES

SITE NAME	SITE ID NUMBER	MEDIUM	RECOMMENDED ALTERNATIVE
Deactivated Landfill	LF01	Soil, drums, and debris	Offsite incineration
Garage	SS06	Soil beneath buildings and associated gravel	Enhanced bioremediation
		Tundra	Enhanced bioremediation
Drainage Pathway from POL Tanks	SS07	Tundra	Monitoring
Crushed Drum Area	SS08	Soil beneath buildings	Enhanced bioremediation
		Tundra	Enhanced bioremediation

The preferred alternative for the soil beneath buildings and associated gravel at the Garage (SS06) and Crushed Drum Area (SS08) is enhanced bioremediation. This alternative reduces COC concentrations to lower levels than biosurfactants, institutional controls and monitoring, and no action. Although the target cleanup level is not met for the maximum concentration of COCs observed, it would be if the average concentration over the area of concern was used. The average concentration is how the site will ultimately be judged clean. Further, the target cleanup level used is from an ADEC guidance document and is, therefore, subject to negotiation. Also, in time biodegradation efficiency could approach 100 percent.

The low levels of tetrachlorethene detected in soil at the Garage (SS06) and described in Section 4.0.2 would not be biodegraded by this alternative but would probably be reduced through volatilization.

Other advantages of enhanced bioremediation of soils beneath the buildings at the Garage (SS06) and the Crushed Drum Area (SS08) include a lower cost than biosurfactants and an opportunity to coordinate the remediation of the associated gravel and the tundra at the Garage and Crushed Drum Area. Finally, community and state acceptance would likely be high for this alternative because it is environmentally benign in its impact on the surrounding areas. The next best alternatives are biosurfactants (assuming a treatability test confirms it would work) and containment.

The preferred alternative for remediating tundra at the Garage (SS06 and Crushed Drum Area (SS08) is enhanced bioremediation. This alternative offers the best short and long term effectiveness without disturbing the tundra. It is the most expensive alternative but is also the only active alternative evaluated. Another advantage of this alternative is the opportunity to reduce cost by coordinating the remediation of tundra with enhanced bioremediation of soils beneath buildings and associated gravel. State and community acceptance are apt to be high because the alternative is environmentally benign. A treatability test is required. The next best alternative is institutional controls and monitoring.

The preferred alternative for the Drainage Pathway from POL Tanks (SS07) is monitoring to determine if the need exists for remedial action. Current data are inconclusive. The cost estimate assumes two rounds of sampling over a three year period. The second round of sampling may not be necessary if the first round samples are clean. If only the first round of sampling is necessary, the cost would be reduced by half.

Estimated costs for performing the preferred alternatives are as follows:

•	Monitoring (presumptive remedy)	\$ 47,800
•	Offsite incineration (excavated material at LF01)	\$3,598,235
•	Enhanced bioremediation (beneath buildings and gravel)	\$ 173,140
•	Enhanced bioremediation (tundra)	<u>\$ 173,510</u>
	TOTAL	\$3,992,685

These alternatives are considered as stand-alone projects, and costs are estimated as such. If a coordinated approach to remediation is used, savings may be realized in preparation of

planning documents, mobilization and demobilization, onsite labor, transportation of equipment, wastes, and samples. In addition, the volume of material that must be treated and disposed has been estimated based on RI sampling and analyses. The actual volume may be reduced by field screening during remediation or may increase if the area of buried wastes and contaminated soil at the Deactivated Landfill (LF01) is greater than estimated. It is recommended that electromagnetic surveying and additional sampling be performed to further characterize the contamination at the Deactivated Landfill (LF01) prior to undertaking any remedial actions.

4.5 SITING STUDY

The remedial alternative for soil, drums, and debris at the Deactivated Landfill, offsite treatment and disposal, will require substantial areas for storing excavated materials and staging the shipping containers. This may be done at the hangar near the Deactivated Landfill (LF01) site.

Enhanced bioremediation of the tundra, soils beneath buildings and associated gravel do not require significant staging areas.

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ATTACHMENT A COST ESTIMATES

•	Drainage Pathway from POL Tanks (SS07)	
	Monitoring	1
•	Soil, Drums, Debris (LF01)	
	No Action	2
	Thermal Desorption	3
	Offsite Incineration	4
•	Tundra	
	No Action	5
	Institutional Controls and Monitoring	6
	Enhanced Bioremediation	7
•	Soils Beneath Buildings and Associated Gravel	
	No Action	8
	Institutional Controls and Monitoring	9
	Containment	10
	Biosurfactants	11
	Enhanced Bioremediation	12

Alternative: Monitoring

Estimated Costs

Sites:

Drainage Pathway from POL Tanks

(SS07)

Medium:

Surface Water

Total volume: Project duration: Not Determined 28 Months

(831 days)

Discount rate:

5% *

	Discount ra	ate:	5% *		
				Fixed	Annual
Description	Quantity	Units	Unit Cost	Cost	Cost
CAPITAL COSTS:					
Planning Documents	2	Report	\$5,000.00	\$10,000	
(Work plan, SAP, QAPjP, H&S)					
NA: Facing and Co. II					
Misc. Equipment and Supplies	2	Lump Sum	\$100.00	\$200	
]			
	T				
Total (Capital Cost	over the 28	Month Project	\$10,200	\$0
OPERATING COSTS:					
Sampling (initial)	4	Sample	\$70.00	\$280	
Sampling (annual)		Event	\$280.00		\$560
Labor	192	Hr	\$70.00	\$13,440	
Per Diem	24	Days	\$175.00	\$4,200	
Project Management		Hr	\$70.00	\$2,016	
Travel for Sampling	6	Trips	\$1,200.00	·	\$7,200
Closure (Month 28)	1	Report	\$5,000.00		\$5,000
Total Ope	erating Cost	over the 28	Month Project	\$19,936	\$12,760
			Month Project	\$30,136	\$12,760
			ent costs (5%)	\$1,507	\$638
			verhead (10%)	\$3,014	\$1,276
			ngency (10%)	\$3,014	\$1,276
Total Adminis	trative Cost		Month Project	\$7,534	\$3,190
	3 3300	NET PRESEN		,001	\$47,800
<u> </u>					777,000

^{*} Estimated discount rate for calculating present value of future costs

Alternative: No Action

Estimated Costs

Site:

Deactivated Landfill

(LF01)

Medium:

Drums/debris/soil

Total volume: Project duration:

625 CY

1 Month

(30 days)

Discount rate: 5% *

	Discount rate	e:	5% *		
				Fixed	Annual
Description	Quantity	Units	Unit Cost	Cost	Cost
CAPITAL COSTS:				:	
				i	
	1				;
Total	Capital Cost o	ver the 1	Month Project	\$0	\$0
OPERATING COSTS:					
Closure	1	Event	\$5,000.00	\$5,000	
					:
			•		
Total On	erating Cost o	over the 1	Month Project	\$5,000	\$0
			Month Project	\$5,000	\$0
T Octain			ent costs (0%)	\$0	\$0
			verhead (10%)	\$500	\$0
			tingency (5%)	\$250	\$0
41		COI	itingchey (0 /0/	1	
Total Adminis	strative Cost of		Month Project		\$0 \$ 5,750

^{*} Estimated discount rate for calculating present value of future costs

Alternative: Thermal Desorption

Estimated Costs

Site:

Medium:

Drums/debris/soil

Deactivated Landfill (LF01)

Total volume: Project duration: 625 CY

17 Months

(501 days)

Discount rate:

5% *

Discount rate: 5% *									
_				Fixed	Annual				
Description	Quantity	Units	Unit Cost	Cost	Cost				
CAPITAL COSTS:									
Planning Documents (RD/RA)	2	Report	\$5,000.00	\$10,000					
(Work plan, SAP, QAPjP, H&S)	_								
Development of Specifications	2	Report	\$5,000.00	\$10,000					
(Draft and Final)			17.500.00	47.500					
Treatability Study		Study	\$7,500.00	\$7,500					
Drum Cost		Drum	\$42.50	\$14,663					
Personal H & S Expendibles Misc. Equipment and Supplies		Day	\$10.00	\$6,425					
Backhoe	1	Lump Sum	\$100.00	\$100					
Staging Area (Liner & Berm)	1	Month	\$3,000.00	\$3,000					
Staging Area (Liner & Berm)	1	Lump Sum	\$5,000.00	\$5,000					
	ł								
	ıl Capital Co	st over the 1	7 Month Project	\$56,688	\$0				
OPERATING COSTS:	Ì								
Mobilize/Demobilize Unit	1	Event	\$300,000.00	\$300,000					
Transport Equipment	1	Event	\$2,000.00	\$2,000					
Thermal Desorption Equipment	10	Month	\$60,750.00	\$607,500					
Thermal Desorption Personnel	10	Month	\$30,885.00	\$308,850					
Thermal Desorption Supplies	10	Month	\$24,150.00	\$241,500					
Incineration of Condensate	345	Drum	\$500.00	\$172,500					
Transportation of Wastes	1	Event	\$150,000.00	\$150,000					
Waste Profiling	1	Event	\$750.00	\$750					
Documentation	1	Event	\$200.00	\$200					
Labor (Oversight and Sampling)	5,188		\$70.00	\$363,160					
Per Diem		Day	\$175.00	\$113,138					
Backhoe Operator	136	1 '	\$50.00	\$6,800					
Sampling and Analysis	1	Sample	\$70.00	\$1,400					
Project Management	778	1	\$70.00	\$54,474					
Closure	1	Report	\$5,000.00	\$5,000					
			10,000.00	70,000					
]							
				ļ					
Total C	nerating Co	st over the 1	7 Month Project	\$2,327,272	\$0				
			7 Month Project	\$2,383,959	\$0				
101	ai Difect CO								
			nent costs (5%)	\$119,198	\$0				
			Overhead (10%)	\$238,396	\$0				
			tingency (25%)	\$595,990	\$0				
Total Admir	nistrative Co		7 Month Project	\$953,584	\$0				
		NET PRESEN	IT WORTH		\$3,337,543				

^{*} Estimated discount rate for calculating present value of future costs

Alternative: Offsite Incineration Estimated Costs

Site:

Medium:

Drums/debris/soil

Deactivated Landfill (LF01)

Total volume:

625 CY

6 Months

(157 days)

Project duration: Discount rate:

5% *

	Discount ra	ite.	5% *	Fixed	Annual
Description	Quantity	Units	Unit Cost	Cost	Cost
CAPITAL COSTS:	Guarracy	0			
Planning Documents (RD/RA)	2	Report	\$5,000.00	\$10,000	
(Work plan, SAP, QAPjP, H&S)	-				
Development of Specifications	2	Report	\$5,000.00	\$10,000	
(Draft and Final)					
Survey Challes	625	Sack	\$40.00	\$2,083	
Super Sacks Drum Cost		Drum	\$42.50	\$425	
Personal H & S Expendibles	1	Day	\$10.00	\$740	
Misc. Equipment and Supplies	1	Lump Sum	\$100.00	\$100	
Staging Area (Liner & Berm)		Lump Sum	\$5,000.00	\$5,000	
Backhoe	1	Month	\$3,000.00	\$3,000	
	ļ				
		1			
	Į				
	1				
	Total Capital	Cost over the	6 Month Project	\$31,348	\$0
OPERATING COSTS:					
Mobilize/Demobilize	1	Event	\$140,000.00	\$140,000	
Transport Equipment	1	Event	\$2,000.00	\$2,000	
Incineration (Solids)	1,125	Ton	\$1,700.00	\$1,912,500	
Incineration (Liquids)	10	Drums	\$500.00	\$5,000	
Transport Wastes	1	Event	\$400,000.00	\$400,000	
Waste Profiling	1	Event	\$750.00	\$750	
Documentation	1	Event	\$200.00	\$200	
Labor (Oversight and Sampling)	640	li e	\$70.00	\$44,800	
Backhoe Operator	136		\$50.00	\$6,800	
Per Diem		Day	\$175.00	\$13,650	
Sampling and Analysis	l l	Sample	\$70.00	\$1,400	
Project Management	•	Hr	\$70.00	\$6,720	
Closure	1	Report	\$5,000.00	\$5,000	
-			C Marth Drainet	62 520 920	\$(
To			6 Month Project	\$2,538,820 \$2,570,168	\$(
	rotal Direct		6 Month Project		\$(
		Procure	ement costs (5%)	\$128,508	
		_	Overhead (10%)	\$257,017	\$(&(
			ontingency (25%)	\$642,542	\$(
Total A	dministrative		6 Month Project	\$1,028,067	\$(
		NET PRESEN	T WORTH		\$3,598,236

^{*} Estimated discount rate for calculating present value of future costs

Alternative: No Action

Estimated Costs

Sites:

Medium:

Tundra

Garage (SS06)

Total volume:

2,730 CY

Crushed Drum Area (SS08)

Project duration:

1 Month

(30 days)

Discount rate: 5% *

	5% *				
				Fixed	Annual
Description	Quantity	Units	Unit Cost	Cost	Cost
CAPITAL COSTS:	:				
				İ	
				j	
Total	Capital Cost	over the	1 Year Project	\$0	\$O
OPERATING COSTS:					
Closure	1	Event	\$5,000.00	\$5,000	
Total Operating Cost over the 1 Month Project					\$0
			Month Project	\$5,000	\$0
		Procureme	ent costs (0%)	\$0	\$0
	/erhead (10%)	\$500	\$0		
			tingency (5%)	\$250	\$0
Total Administr	ative Cost o		Month Project	\$750	\$0
		\$5,750			

^{*} Estimated discount rate for calculating present value of future costs

Alternative: Institutional Controls and Monitoring Estimated Costs

Sites:

Medium:

Tundra

Garage (SS06)

Total volume:

2,730 CY

Crushed Drum Area (SS08)

Project duration:

29 Months

(881 days)

\$66,143

Discount rate: 5% *							
Description	Quantity	Units	Unit Cost	Fixed Cost	Annual Cost		
CAPITAL COSTS: Planning Documents (Work plan, SAP, QAPjP, H&S)	2	Report	\$5,000.00	\$10,000			
Misc. Equipment and Supplies	1	Lump Sum	\$100.00	\$100			
				:			
Total	 Capital Cost	over the 29	Month Project	\$10,100	\$0		
OPERATING COSTS:							
Implement Institutional Controls	1	Event	\$10,000.00	\$10,000			
Sampling	3	Event	\$560.00	i	\$1,680		
Labor	240	Hr	\$70.00	\$16,800			
Per Diem	30	Days	\$175.00	\$5,250			
Project Management	ı	Hr	\$70.00	\$2,520			
Travel for Sampling	1	Trips	\$1,200.00		\$4,800		
Closure (Month 29)	1	Report	\$5,000.00		\$5,000		
				į			
Total Op	erating Cost	over the 29	Month Project	\$34,570	\$11,480		
Total Direct Cost over the 29 Month Project					\$11,480		
Procurement costs (5%)					\$574		
	\$2,234 \$4,467	\$1,148					
	\$4,467	\$1,148					
Total Adminis	trative Cost		ingency (10%) Month Project	\$11,168	\$2,870		

^{*} Estimated discount rate for calculating present value of future costs

NET PRESENT WORTH

Alternative: Enhanced Bioremediation

Estimated Costs

Sites:

Garage (SS06)

Medium:

Tundra

Total volume:

2,730 CY

Crushed Drum Area (SS08)

Project duration:

33 Months

(988 days)

Description	Quantity	Units	Unit Cost	Fixed Cost	Annual Cost
CAPITAL COSTS: Planning Documents (RD/RA)	3	Report	\$5,000.00	\$15,000	
(Work plan, SAP, QAPjP, H&S) Develop Specifications (30%, 95%, 100%)	3	Report	\$5,000.00	\$15,000	
Permitting (Air & Water) Treatability study		Event Study	\$2,000.00 \$7,500.00	\$4,000 \$7,500	
Compressor Nutrients Empty sand bags Hose Booms Trash pump Personal H & S Expendibles Misc. Equipment and Supplies	1,092 43 1 5 1 60	Month Lb Bag Hose Boom Month Day Lump Sum	\$2,000.00 \$1.00 \$0.47 \$50.00 \$24.53 \$420.00 \$10.00	\$2,000 \$1,092 \$20 \$50 \$123 \$420 \$600 \$1,000	
Total OPERATING COSTS:	Capital Cost	over the 33	Month Project	\$46,805	\$0
Mobilize/Demobilize Transport Nutrients Transport Equipment	1	Event	\$30,000.00	\$30,000	
Labor	528	Hr	\$70.00	\$36,960	
Per diem		Day	\$175.00	\$11,200	
Sampling & Analysis (initial)		Sample	\$70.00	\$420	
Sampling & Analysis (annual)	ž .	Event	\$420.00		\$840
Travel for Sampling	4	Trips	\$1,200.00		\$4,800
Project Management	79	Hr	\$70.00	\$5,544	
Closure	1	Report	\$5,000.00		\$5,000
Total On	erating Cost	over the 33	Month Project	\$84,124	\$10,640
			Month Project	\$130,929	\$10,640
, 0.0.			ent costs (5%)	\$6,546	\$532
	Overhead (10%)				
			ingency (10%)	\$13,093 \$13,093	\$1,064 \$1,064
Total Adminis	strative Cost		Month Project	\$32,732	\$2,660
		NET PRESEN		<u> </u>	\$173,509

^{*} Estimated discount rate for calculating present value of future costs

Alternative: No Action

Estimated Costs

Sites:

Medium:

Soils beneath building and gravel

Garage (SS06)

Total volume:

355 CY

Crushed Drum Area (SS08)

Project duration: 1 Month

(30 days)

Discount rate:

5% *

	Discount ra	ite:	5% *		
				Fixed	Annual
Description	Quantity	Units	Unit Cost	Cost	Cost
CAPITAL COSTS:					
Total C	apital Cost o	ver the 1	Month Project	\$0	\$0
OPERATING COSTS:	[
Closure	1	Event	\$5,000.00	\$5,000	
Total Opp	rating Cost o	ver the 1	l Month Project	\$5,000	\$0
Total I	\$5,000	\$0			
Total	\$0	\$0			
	Procurement costs (0%) Overhead (10%)				
	tingency (5%)	\$500 \$250	\$0		
Total Admini	strative Cos		1 Year Project	\$750	\$0
	SENT WORTH		\$5,750		

^{*} Estimated discount rate for calculating present value of future costs

Alternative: Institutional Controls and Monitoring **Estimated Costs**

Sites:

Medium:

Soils beneath building and gravel

Garage (SS06)

Total volume:

355 CY

Crushed Drum Area (SS08) Project duration: 29 Months

(881 days)

\$68,289

Crushed Drum Area (5508)	Discount ra		29 Months 5% *	(88)	days)
Description	Quantity	Units	Unit Cost	Fixed Cost	Annual Cost
CAPITAL COSTS:	additaty	Onits	Omit Gost	003(0031
Planning Documents (Work plan, SAP, QAPjP, H&S)	2	Report	\$5,000.00	\$10,000	
Misc. Equipment and Supplies	1	Lump Sum	\$100.00	\$100	
	Capital Cost	over the 29	Month Project	\$10,100	\$0
OPERATING COSTS:		_			
Implement Institutional Controls		Event	\$10,000.00	\$10,000	
Sampling (initial)		Sample	\$70.00	\$840	A1 C00
Sampling (annual)	B .	Event	\$840.00	410 000	\$1,680
Labor	240	ļ	\$70.00	\$16,800	
Per Diem	1	Days	\$175.00	\$5,250	
Project Management		Hr	\$70.00	\$2,520	Å7.000
Travel for Sampling	4	Trips	\$1,200.00		\$7,200 \$5,000
Closure (Month 29)	1	Report	\$5,000.00		\$5,000
Total On	erating Cost	over the 29	Month Project	\$35,410	\$13,880
	Total Operating Cost over the 29 Month Project Total Direct Cost over the 29 Month Project				
Total	COS		ent costs (5%)	\$45,510 \$2,276	\$13,880 \$694
			verhead (10%)	\$4,551	\$1,388
Contingency (10%)					\$1,388
Total Adminis	strative Cost		Month Project	\$4,551 \$11,378	\$3,470
Total Adminis	¥11,070	70,770			

^{*} Estimated discount rate for calculating present value of future costs

NET PRESENT WORTH

Alternative: Containment

Estimated Costs

Sites:

Medium:

Soils beneath building

Garage (SS06)

Total volume:

310 CY

Crushed Drum Area (SS08)

Project duration:

4 Months

(119 days)

\$133,783

	Discount ra	ite:	5% *		
D	O	Units	Unit Cost	Fixed Cost	Annual Cost
Description CAPITAL COSTS:	Quantity	Units	Unit Cost	Cost	Cost
Planning Documents (RD/RA) (Work plan, SAP, QAPjP, H&S)	3	Report	\$5,000.00	\$15,000	
Insulation Gravel Cover Miscellaneous Equipment (including Heat Exchangers)	31	Sq Ft Ton Lump Sum	\$2.00 \$100.00 \$5,000.00	\$1,860 \$3,100 \$5,000	
Tota	al Capital Co	st over the 4	Month Project	\$24,960	\$0
Mobilize/Demobilize Labor Per diem Project Management		Event Hr Day Hr	\$30,000.00 \$70.00 \$175.00 \$70.00	\$30,000 \$35,840 \$10,850 \$5,376	
Total	Inorating Co	st over the 4	Month Project	\$82,066	\$0
The state of the s			Month Project		\$0
10	ai Direct CU		ent costs (5%)		\$0
Overhead (10%)					\$0
			ingency (10%)		\$0
Total Admir	nistrative Co		Month Project		\$C

^{*} Estimated discount rate for calculating present value of future costs

NET PRESENT WORTH

Alternative: Biosurfactants

Estimated Costs

Sites:

Medium:

Soils beneath building and gravel

Garage (SS06)

Total volume:

355 CY

Crushed Drum Area (SS08)

Project duration:

7 Months

(201 days)

Discount rate:

nt rate:	5%	
----------	----	--

	Discount ra	ile.	5%		
				Fixed	Annual
Description	Quantity	Units	Unit Cost	Cost	Cost
CAPITAL COSTS:					
Planning Documents (RD/RA)	3	Report	\$5,000.00	\$15,000	
(Work plan, SAP, QAPjP, H&S)					
Develop Specifications	3	Report	\$5,000.00	\$15,000	
(30%, 95%, 100%)			1		
Permitting (Air & Water)	2	Event	\$2,000.00	\$4,000	
Treatability study	1	Study	\$7,500.00	\$7,500	
Air Knife Purchase (pair)	1	Pair	\$6,000.00	\$6,000	
Compressor	1	Month	\$2,000.00	\$2,000	
Biosurfactant	1,950	Gal	\$22.70	\$44,262	
Trash pump	· -	Month	\$420.00	\$420	
Booms	528	Boom	\$24.53	\$12,952	
Hoses	1	Hose	\$50.00	\$50	
Empty Sand Bags		Bag	\$0.47	\$12	
Purchase Empty Drums		Drum	\$42.50	\$4,803	
Personal H & S Expendibles		Day	\$10.00	\$420	
Misc. Equipment and Supplies		Lump Sum	\$1,000.00	\$1,000	
		·			
Total	Capital Co	st over the 7	l Month Project	\$113,418	\$0
OPERATING COSTS:	Cupital Co.	1		7110,110	- +0
Mobilize/Demobilize	1	F.,	\$30,000.00	620,000	
	l	Event	\$30,000.00	\$30,000	
Transport Biosurfactant					
Transport Equipment					
Labor	384		\$70.00	\$26,880	
Per diem		Day	\$175.00	\$8,050	:
Sampling & Analysis (initial)	12	Sample	\$70.00	\$840	
Sampling & Analysis (final)	1	Event	\$840.00	\$840	
Project Management	58	Hr	\$70.00	\$4,032	
Closure	1	Report	\$5,000.00	\$5,000	
				·	
Total O	perating Co	st over the 7	Month Project	\$75,642	\$0
Tota	al Direct Co	st over the 7	Month Project	\$189,060	\$0
		Procureme	ent costs (5%)	\$9,453	\$0
		0\	erhead (10%)		\$0
			ngency (10%)	\$18,906	\$0
Total Admin	istrative Co		Month Project	\$47,265	\$0
	IT WORTH		\$236,325		

^{*} Estimated discount rate for calculating present value of future costs

Alternative: Enhanced Bioremediation Estimated Costs

Sites:

Medium:

Soils beneath building and gravel

Garage (SS06)

Crushed Drum Area (SS08)

Total volume:

355 CY

Project duration:

33 Months

(988 days)

\$173,142

Crushed Drum Area (5508)	Discount ra		5% *	(300	,-,
	Discount to		1	Fixed	Annual
Description	Quantity	Units	Unit Cost	Cost	Cost
CAPITAL COSTS:					
Planning Documents (RD/RA)	3	Report	\$5,000.00	\$15,000	
(Work plan, SAP, QAPjP, H&S)	,	D	\$5,000.00	\$15,000	
Develop Specifications (30%, 95%, 100%)	3	Report	\$5,000.00	\$10,000	
Permitting (Air & Water)	2	Event	\$2,000.00	\$4,000	
Treatability study		Study	\$7,500.00	\$7,500	
				40.000	
Compressor	l .	Month	\$2,000.00 \$1.00	\$2,000 \$142	
Nutrients	142	Lb Bag	\$1.00	\$142	
Empty sand bags Hose		Hose	\$50.00	\$50	
Booms		Boom	\$24.53	\$196	
Trash pump		Month	\$420.00	\$420	
Personal H & S Expendibles		Day	\$10.00	\$600	
Misc. Equipment and Supplies	1	Lump Sum	\$1,000.00	\$1,000	
					1
	Capital Cost	over the 33	Month Project	\$45,920	\$0
OPERATING COSTS:		_		+00.000	
Mobilize/Demobilize	!	Event	\$30,000.00	\$30,000	
Transport Nutrients	t				
Transport Equipment	528		\$70.00	\$36,960	
Labor	i	Day	\$175.00	\$11,200	
Per diem Sampling & Analysis (initial)	1	Sample	\$70.00	\$630	
Sampling & Analysis (initial)	1	Event	\$630.00	4000	\$1,260
Travel for Sampling	1	Trips	\$1,200.00		\$4,800
Project Management		Hr	\$70.00	\$5,544	,
Closure		Report	\$5,000.00	,	\$5,000
Total Ope	erating Cost	over the 33	Month Project	\$84,334	\$11,060
			Month Project	\$130,254	\$11,060
Procurement costs (5%)					\$553
		0,	verhead (10%)	\$13,025	\$1,106
		Cont	ingency (10%)	\$13,025	\$1,106
Total Adminis	trative Cost	over the 33	Month Project	\$32,563	\$2,765

^{*} Estimated discount rate for calculating present value of future costs

NET PRESENT WORTH

ATTACHMENT B ESTIMATED DURATION

•	Drainage Pathway from POL Tanks (SS07)	
	Monitoring	•
•	Soil, Drums, Debris (LF01)	
	No Action	2
	Thermal Desorption	;
	Offsite Incineration	4
•	Tundra	
	No Action	
	Institutional Controls and Monitoring	•
	Enhanced Bioremediation	7
•	Soils Beneath Buildings and Associated Gravel	
	No Action	8
	Institutional Controls and Monitoring	ç
	Containment	10
	Biosurfactants	11
	Enhanced Bioremediation	12

Alternative: Monitoring Estimated Project Duration

Sites:

Drainage Pathway from POL Tanks

(SS07)

Start Date: Day 1

Medium: Surface Water

		Start	End
Activity	Duration	Date	Date
Development of Planning Documents	60 Days	Day 1	Day 60
Mobilization	2 Days	Day 61	Day 62
First Biannual Sampling	3 Days	Day 63	Day 65
Second Biannual Sampling	3 Days	Day 796	Day 798
Demobilization	2 Days	Day 799	Day 800
Development of Closure Report	30 Days	Day 801	Day 830
Closure	0 Days	Day 831	Day 831
PROJECT DURATION	831 Days		

Alternative: No Action Estimated Project Duration

Sites:

Start Date: Day 1

Deactivated Landfill (LF01)

Medium: Drums/debris/soil

		Start	End
Activity	Duration	Date	Date
Development of Closure Report	30 Days	Day 1	Day 30
Closure	0 Days	Day 30	Day 30
PROJECT DURATION	30 Days		

Alternative: Thermal Desorption

Estimated Project Duration

Site:

Start Date: Day 1

Deactivated Landfill (LF01)

Medium: Drums/debris/soil

		Start	End
Activity	Duration	Date	Date
Perform Treatability Study	60 Days	Day 1	Day 60
Development of Planning Documents	90 Days	Day 61	Day 150
Development of Specifications	60 Days	Day 61	Day 120
Mobilize	14 Days	Day 151	Day 164
Preliminary Sampling	1 Days	Day 165	Day 165
Remediation	298 Days	Day 166	Day 463
Final Sampling	1 Days	Day 464	Day 464
Demobilize	7 Days	Day 465	Day 471
Develop Closure Report	30 Days	Day 472	Day 501
Secure Closure	0 Days	Day 501	Day 501
PROJECT DURATION 501 Days			

Alternative: Offsite Incineration Estimated Project Duration

Site:

Start Date: Day 1

Deactivated Landfill (LF01)

Medium: Drums/debris/soil

		Start	End
Activity	Duration	Date	Date
Development of Planning Documents	90 Days	Day 1	Day 90
Development of Specifications	60 Days	Day 1	Day 60
Mobilize	7 Days	Day 91	Day 97
Preliminary Sampling	1 Days	Day 98	Day 98
Excavation, Containerization, and	21 Days	Day 99	Day 119
Staging for Transport Final Sampling	1 Days	Day 120	Day 120
Demobilize	7 Days	Day 121	Day 127
Develop Closure Report	30 Days	Day 128	Day 157
Secure Closure	0 Days	Day 157	Day 157
PROJECT DURATION	157 Days		

Alternative: No Action Estimated Project Duration

Sites:

Activity

Closure

Garage (SS06)

Start Date: Day 1

Crushed Drum Area (SS08)

Development of Closure Report

Medium: Tundra

Start End
Duration Date Date

30 Days Day 1 Day 30

0 Days Day 30 Day 30

PROJECT DURATION 30 Days

Alternative: Institutional Controls and Monitoring Estimated Project Duration

Sites:

Garage (SS06) Crushed Drum Area (SS08) Start Date: Day 1 Medium: Tundra

		Start	End
Activity	Duration	Date	Date
Development of Planning Documents	60 Days	Day 1	Day 60
Implementation of Institutional Controls	60 Days	Day 61	Day 120
Mobilize	2 Days	Day 121	Day 122
Preliminary Sampling	3 Days	Day 123	Day 125
Demobilization	2 Days	Day 126	Day 127
End of First Year Sampling	3 Days	Day 487	Day 489
End of Second Year Sampling	3 Days	Day 849	Day 851
Develop Closure Report	30 Days	Day 852	Day 881
Secure Closure	0 Days	Day 881	Day 881
PROJECT DURATION	881 Days		

Alternative: Enhanced Bioremediation Estimated Project Duration

Sites:

Garage (SS06)

Crushed Drum Area (SS08)

Start Date: Day 1 Media: Tundra

		Start	End
Activity	Duration	Date	Date
Perform Treatability Study	60 Days	Day 1	Day 60
Development of Planning Documents	90 Days	Day 61	Day 150
Development of Specifications	60 Days	Day 61	Day 120
Permits	60 Days	Day 151	Day 210
Mobilization	7 Days	Day 211	Day 217
Preliminary Sampling	3 Days	Day 218	Day 220
Application of nutrients and water	7 Days	Day 221	Day 227
Demobilization	7 Days	Day 228	Day 234
End of First Year Sampling	3 Days	Day 594	Day 596
End of Second Year Sampling	3 Days	Day 956	Day 958
Development of Closure Report	30 Days	Day 959	Day 988
Closure	0 Days	Day 988	Day 988
PROJECT DURATION	988 Days		

Alternative: No Action Estimated Project Duration

Sites:

Garage (SS06)

Start Date: Day 1

Crushed Drum Area (SS08)

Medium: Soils beneath building and gravel

		Start	End
Activity	Duration	Date	Date
Development of Closure Report	30 Days	Day 1	Day 30
Closure	0 Days	Day 30	Day 30
PROJECT DURATION	30 Days		

Alternative: Institutional Controls and Monitoring Estimated Project Duration

Sites:

Garage (SS06) Start Date: Day 1

Crushed Drum Area (SS08) Medium: Soils beneath building and gravel

		Start	End
Activity	Duration	Date	Date
Development of Planning Documents	60 Days	Day 1	Day 60
Implementation of Institutional Controls	60 Days	Day 61	Day 120
Mobilization	2 Days	Day 121	Day 122
Preliminary Sampling	3 Days	Day 123	Day 125
Demobilization	2 Days	Day 126	Day 127
End of First Year Sampling	3 Days	Day 487	Day 489
End of Second Year Sampling	3 Days	Day 849	Day 851
Development of Closure Report	30 Days	Day 852	Day 881
Closure	0 Days	Day 881	Day 881
PROJECT DURATION	881 Days		

Alternative: Containment Estimated Project Duration

Sites:

Garage (SS06) Start Date: Day 1

Crushed Drum Area (SS08) Media: Soils beneath building

	Duration	Start Date	End Date
Activity	Duration		
Development of Planning Documents	90 Days	Day 1	Day 90
Mark III wasta a	7 Days	Day 91	Day 97
Mobilization	/ Days	Bay 51	Day or
Installation of Containment	15 Days	Day 98	Day 112
	,		-
Demobilization	7 Days	Day 113	Day 119
PROJECT DURATION	119 Days		

Alternative: Biosurfactants Estimated Project Duration

Sites:

Garage (SS06)

Crushed Drum Area (SS08)

Start Date: Day 1

Media: Soils beneath building and gravel

		Start	End
Activity	Duration	Date	Date
Development of Planning Documents	90 Days	Day 1	Day 90
Development of Specifications	60 Days	Day 1	Day 60
Permits	60 Days	Day 91	Day 150
Mobilization	7 Days	Day 151	Day 157
Preliminary Sampling	3 Days	Day 158	Day 160
Application of biosurfactant to soil and requisite nutrients to drums of collected water	7 Days	Day 161	Day 167
Final Sampling	1 Day	Day 168	Day 168
Demobilization	3 Days	Day 169	Day 171
Development of Closure Report	30 Days	Day 172	Day 201
Closure	0 Days	Day 201	Day 201
PROJECT DURATION	201 Days		

Alternative: Enhanced Bioremediation Estimated Project Duration

Sites:

Garage (SS06)

Crushed Drum Area (SS08)

Start Date: Day 1

Media: Soils beneath building and gravel

		Start	End
Activity	Duration	Date	Date
Perform Treatability Study	60 Days	Day 1	Day 60
Development of Planning Documents	90 Days	Day 61	Day 150
Development of Specifications	60 Days	Day 61	Day 120
Secure Permits	60 Days	Day 151	Day 210
Mobilization	7 Days	Day 211	Day 217
Preliminary Sampling	3 Days	Day 218	Day 220
Application of nutrients and water	7 Days	Day 221	Day 227
Demobilization	7 Days	Day 228	Day 234
End of First Year Sampling	3 Days	Day 594	Day 596
End of Second Year Sampling	3 Days	Day 956	Day 958
Development of Closure Report	30 Days	Day 959	Day 988
Closure	0 Days	Day 988	Day 988
PROJECT DURATION	988 Days		

APPENDIX A

REFERENCES AND LIST OF ACRONYMS, ABBREVIATIONS, AND UNITS OF MEASUREMENT

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LIST OF ACRONYMS, ABBREVIATIONS, AND UNITS OF MEASUREMENT

Alaska Department of Environmental Conservation ADEC

Air Force Center for Environmental Excellence **AFCEE**

United States Air Force Air Force

Applicable or Relevant and Appropriate Requirement ARAR

ATV All-Terrain Vehicle

BDAT Best Demonstrated Available Technology

Benzene, Toluene, Ethylbenzene, and Xylene BTEX

Comprehensive Environmental Response, Compensation, and CERCLA

Liability Act of 1980

Chemical of Concern COC

Commercial Testing & Engineering Co. CT&E

Defense Environmental Quality Program Policy Memorandum DEQPPM

Department of Defense DOD DRO Diesel Range Organics

Diesel Range Petroleum Hydrocarbons DRPH U.S. Environmental Protection Agency **EPA**

Ecological Risk Assessment ERA

F&B Friedman & Bruya, Inc.

Feasibility Study FS

Federal Water Pollution Control Act **FWPCA**

Gas Chromatograph GC

Gas Chromatography/Mass Spectrometry GC/MS

General Response Action GRA GRO Gasoline Range Organic

Gasoline Range Petroleum Hydrocarbons GRPH

Hazard Quotient HQ

Halogenated Volatile Organic Compound HVOC

Inductively Coupled Plasma **ICP IDW** Investigation Derived Waste IRP

Installation Restoration Program

LRR Long Range Radar

Maximum Contaminant Level MCL

Mean Sea Level MSL

National Contingency Plan NCP

NPL National Priorities List **PCB** Polychlorinated Biphenyl

PCE Tetrachlorethylene **Quality Assurance** QA

Quality Assurance/Quality Control QA/QC

LIST OF ACRONYMS, ABBREVIATIONS, AND UNITS OF MEASUREMENT (CONTINUED)

QAPiP Quality Assurance Project Plan

QC Quality Control

RAGS Risk Assessment Guidance for Superfund

RBSL Risk-Based Screening Level

RCRA Resource Conservation and Recovery Act
RI/FS Remedial Investigation/Feasibility Study

RI Remedial Investigation

SAP Sampling and Analysis Plan

SARA Superfund Amendments and Reauthorization Act of 1986

SOP Standard Operating Procedure

SRR Short Range Radar

SVOC Semi-Volatile Organic Compound

TCE Trichloroethylene

TCLP Toxicity Characteristic Leaching Procedure

TDS Total Dissolved Solids

TPH Total Petroleum Hydrocarbons

TOC Total Organic Carbon
TRV Toxicity Reference Value
TSS Total Suspended Solids
UCL Upper Confidence Limit

VOC Volatile Organic Compound

MEASUREMENTS

μg/L micrograms per liter

cy cubic yards

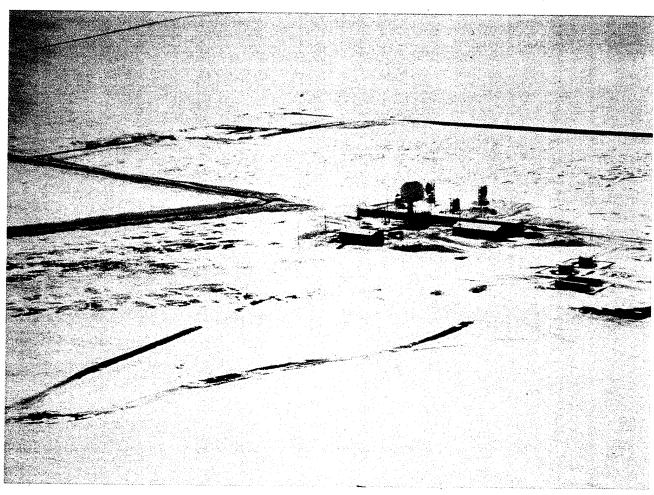
gpm gallons per minute

mg/kg milligrams per kilogram

ppb parts per billion ppm parts per million

APPENDIX B

PHOTOGRAPHS OF POINT LAY RADAR INSTALLATION AND SITES



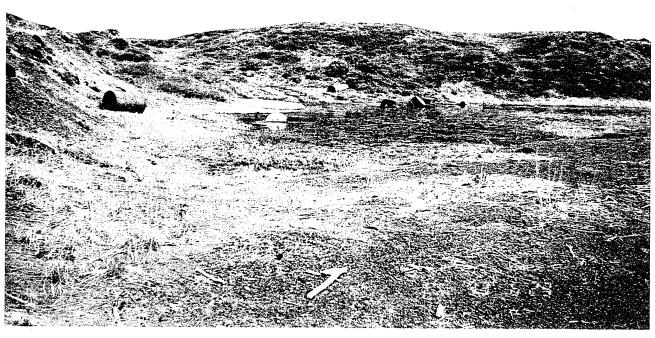
An aerial view to the south of the Point Lay radar installation in May.



This view shows the Point Lay radar installation and the community of Point Lay in the background, to the left. The community is located approximately three quarters of a mile to the north of the installation.



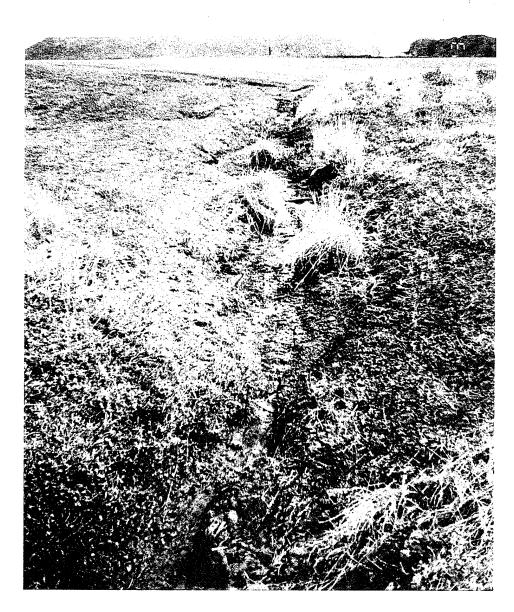
The Deactivated Landfill (LF01) site is located behind the hangar south of the main installation. This view is to the north.



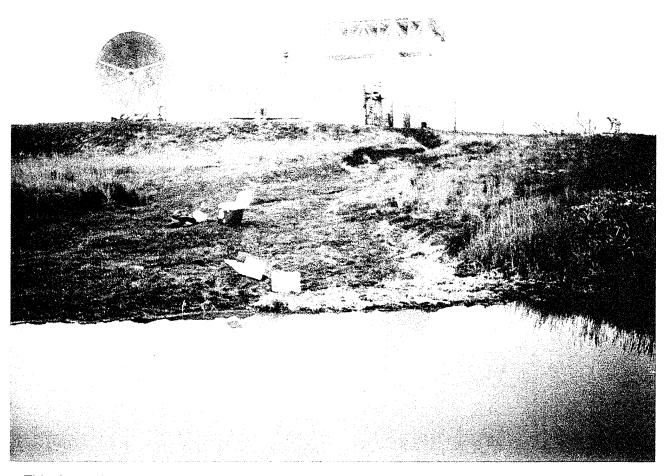
A view to the east along the southern edge of the Deactivated Landfill (LF01) site.



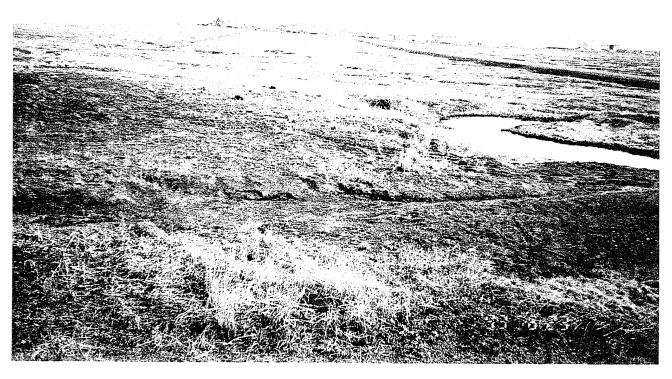
This is a view to the southeast of the Garage (SS06) site at Point Lay.



The Drainage Pathway from POL Tanks (SS07) site consists of several channels, like the one shown here, that drain to the west.



This is a view to the southwest of the Crushed Drum Area (SS08) site. This area was investigated because of previous drum crushing activities at the site.



A view to the north of the Crushed Drum Area (SS08) site with the community of Point Lay in the background.

APPENDIX C COPY OF THE TASK DESCRIPTIONS AND STATEMENT OF WORK

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F33615-90-0-4010-0022 Page 2 of 3

- 1. In accordance with the provisions of the Basic Contract F33615-90-D-4010 and this Delivery Order 0022, the contractor small accomplish the effort described in the Statement of Work (SOW) dated 16 MAR 93 attached hereto at a total ceiling price of \$299.855.00.
- 2. As a result of paragraph 1 above, the subject order is more specifically modified as set forth below:

SECTION B - THE SCHEDULE:

Itam No	Supplies/Services	Quantity Purch Unit	Unit Price Total Item Amt	
0001	CLIN Sec class: U	1	N —	
	noun: SAMPLING. ANALYSIS AND DATA acrn: AA nsn: N site codes pqs: D acp: D fob: D pr/mipr data: FY7624-93-08202 type contract: Y	LO	N .	

Conduct work in accordance with the Statement of Hork (SOW) of this order, dated 16 MAR 93 and Section C. The Description/Specifications of the Basic contract. Submit data in accordance with Attachment #1, the Contract Data Requirements List (CDRL) of the basic contract as implemented by paragraph VI of this order's SOW dated

0002 CLIN SEC Class: U I N
noun: SUPPORT LO M

acrn: AA nsn: N site codes pga: D acp: D fob: D pr/mipr data: FY7624-93-08202 type contract: Y

descriptive data:
Provide support in accordance with the Statement
of Work (SOW) of this order, dated 16 MAR 93
and Section C. The Description/Specification
of the basic contract.

F33615-90-D-4010-0022 Page 3 of 3

3. SECTION C - Description/Specification: - See attached Statement of Work entitled "Installation Restoration Program/Remedial Investigation/Feasibility Study for Distant Early Warning (DEW) line Sites, AK (Barter Island AFS (BAR-M), Bullen Point AFS (POW-3), Point Lonely AFS (POW-1), Point Barrow AFS (POW-M), Point Lay AFS (LIZ-2), Wainwright AFS (LIZ-3), and Cliktok Point AFS (POW-2)" dated I5 MAR 93.

4. SECTION F - Schedule Data:

Item No	Supplies Schadule Data	Delivery Quantity	Schedule
0001	CLIN Del Sch acrn: AA		Date
	descriptive data:	1	93DEC31
	accordance with the Statement of Wo dated 16 MAR 93. All data shall be contract as implemented by paragrap Statement of Work dated by paragrap	ork (SOW) delivered the basic h VI of the	
	shall be accepted by the Government than 31 DEC 93.	not later	

0002

CLIN Del Sch U : 22813 202 acrn: AA

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93DEC31

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descriptive data: Technical effort shall be completed in accordance with the Contract Data Requirements List (Attachment #1) of the basic contract as implemented by paragraph VI of the Statement of

POB 133015-40-0-4010-0022 Attachment | Page 1 of 7

1993 March 16

STATEMENT OF WORK INSTALLATION RESTORATION PROGRAM REMEDIAL INVESTIGATION/FEASIBILITY STUDY

STAGE 1

DISTANT EARLY WARNING (DEW) LINE SITES and CAPE LISBURNE AFS. AR

DESCRIPTION OF WORK **T** .

1.1 scopo

1.1.1 Background. The objective of the Air Force Installation Restoration Program (IRP) is to assess past hazardous waste disposal and spill sites on Air Force installations and develop remedial actions consistent with the National Contingency Plan (NCP) for those sites which pose a threat toimman health and welfare or the environment. This objective is achieved through a Remodial Investigation Feasibility Study (RI/FS) process in which conclusions and recommendations drawn from accurate and validated data are used to structure and guide subsequent activities.

The RI/TS process includes scoping to define data requirements and objectives, a remedial investigation to characterize sites for a baseline risk assessment, and a feasibility study to define and evaluate alternative remedial actions so that a recommended action may be selected. Each of these steps of the RI/FS process can be conducted in stages that focus on particular aspects of the

The contractor shall accomplish the actions described in this Statement of Werk (SOW) to complete the RI/FS process at the Mollowing seven Dew Line Sites

Barrer Island AFS (BAR-M); Bullen Point AFS (POW-3); Point Lonely AFS (POW-1); Point Bazzow AFS (FOW-M): Point Lay AFS (LIZ-2); Wainwright AFS (LIZ-3); and

- 1.1.2 Requirements for Project Activities. Restoration Program (IRP) Handbook referenced in this Statement of Work The Installation provides requirements for laboratory and field activities and applicable formats for project documents that shall be used by the contractor. Volume 1 of the Handbook dated May 1992 is provided under separate cover. This document is referenced in this Statement of Work as the Handbook. The contractor is responsible for the thorough knowledge and understanding of the pravious findings and recommendations that affect this task prior to the start of field activities. The documents involved include but are not limited to the IRP Phase I Records Search, and the IRP Phase II plans and reports addressing the Dew Line Sites and Cape Lisburne.
- 1.1.3 Mestings. A maximum of two (2) contractor personnel, including the project leader, shall attend four (4) meetings at Elmendorf APB, AK. Each meeting shall be two (2) 8-hour workdays in duration. All meetings shall be
- 1.1.4 Special Notifications. The contractor shall immediately report to the TFM. or designate, via telephone, any data or results generated during this investigation which may indicate an imminent health risk. Following this telephone notification, a written notice shall be prepared and

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delivered within three (3) days. This notification shall include supporting documentation (sequence 16, para 6.1)

1.2 Project scoping Documents

The purpose of the project scoping documents is to clearly and comprehensively define project activities prior to the initiation of field work. The contractor shall prepare and submit the following project scoping documents for this task prior to the initiation of any field activities or laboratory analyses.

- 1.2.1 Engineering Network Analysis. Provide within ten (10) days after the issuance of an order a computer generated network analysis which is a detailed task plan for the RI/FS work efforts. The network analysis (CANTY) chart shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of work scheduled for completion by any given date during the period of the delivery order. The network analysis (GANTY) shall show both serial and parallel subtasks leading to a deliverable product or report, and shall show early and late start and completion dates with float. The network analysis (GANTY) shall be updated and submitted quarterly (sequence 3, para 6.1).
- 1.2.2 Work Plan. This section will discuss the overall approach, (including a brief summary of the Conceptual Site Model and Data Quality Objectives), major tasks, scope, timeline, and major decision points. Due to the extreme remoteness of the Dew Line Sites and Cape Lisburne, the contractor shall include a detailed plan for logistics and strategy to complete the RI/FS In preparing the Work Plan, use previous reports and the information gathered during the literature search and presurvey along with experience at similar developed during previous IRP stages (sequence 4, para 6.1).
- 1.2.3 Sampling and Analysis Plan (SAP). The SAP consists of a quality assurance plan (QAPP) and a Field Sampling Plan (FSP). Prepare a SAP describing how project activities will be accomplished in the format specified in section 1 of the Handbook. Incorporate review comments and obtain TPM concurrence prior to the start of field activities (sequence 4, para 6.1).
- 1.2.4 Health and Safety Plan (MSF). Provide a written Health and Safety Plan within eight (8) weeks after the issuance of an order. The contractor shall comply with USAF, OSHA, EPA, state, and local health and safety regulations regarding the proposed work effort. Use EPA guidelines for the Health and Safety Plan shall provide no less protection than the protection contained in the manual entitled "Health and Safety Requirements for Employees Engaged in Field Activities" dated 1981 and the "Occupational Safety and Health Manual for Hazardous Waste Sites Activities" dated 1985 and regulatory agencies prior to submittal to AFCEE/ESR. The contractor shall certify to AFCEE/ESR that the contractor has reviewed the coordinated Health and Safety Plan with each employee and also subcontractor's employees prior to the time each employee engages in field activities (sequence 4, para 6.1).
- 1.2.5 Community Relations Plan. The contractor shall prepare a Community Relations Plan (CRP) for the DEW Line Sites and Cape Lisburna AFS outlining the specific public communications and involvement techniques to be used in coordination with remedial site activities (sequence 4, para 6:1). Follow the guidance contained in "Community Relations in Superfund, a Handbook", office of Solid Waste and Emergency Response (OSWER) Directive

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P07 F33615-90-0-4010-00 2: Attachment ! Page 3 of 7

9230.0-03C (EPA/540/R-92/009, Canuary 1992, P892-963341), and other applicable directives. Also, use as a guidance praviously accomplished CRP from other installations in Alaska. Appropriately adapt such guidance to the local situation at the DEW Line Sites and Cape Lieburne. As described in OSWER Diractive 9230.0-03C, the CRP shall include, but not be limited to, a description of the sites and the community, an overview of the community involvement to date, key community concerns regarding the site and AP site activities, and suggested community relations activities. A contact list of elected officials, agency representatives, and interested groups and individuals shall be included in appropriate copies of the plan. In addition, the plan will include suggested locations for meetings and information repositories. Contractor activities to develop the CRP shall include conducting a raview of site information provided by the AF.

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The contractor shall conduct the following tasks to achieve the purposes stated harein, in compliance with approved scoping documents, the Handbook, and all applicable regulations and requirements.

- Community Relations. Provide support to the base public affairs office for the tasks described below pertaining to the RI/FS Community
- 1.3.1.1 Public meetings and workshops. The contractor shall be responsible for coordinating public meetings and workshops for all DEW Line Sites and Cape Lisburne AFS. This includes producing briefing scripts, slides and any associated products such as response cards and sign-in sheets. As requested by the base Community Relations office in coordination with the TPM. research and provide materials for public quertes, news media quertes, and news releases. Assume a maximum of one (1) workshop/meeting (Seq. nes. 3.9).
- 1.3.1.2 Public notices. As required by the base Community Relations office and the TPM, the contractor shall prepare and publish public notices for the Feirbanks and local newspapers. The purpose of these notices is to inform the public of a meeting, workshop, or comment period in which they have the opportunity to be involved in the ERP Frogram at DEW Line Sites and Cape Lisburne AFS. Also, these notices may be utilized to inform the public of other pertinent program information such as quarrarly notices of documents placed in the information repositories. The format for the notices shall be coordinated with the Community Relations office and TPM, and then submitted to the TPM for review prior to delivery to the base. Assume a maximum of two (2) notices (5eq. no. 3).
- 1.3.1.3 Photo Notabook The contractor shall develop a photo netabook which focuses on the overall IRP program at DEW Line Sites and Cape Liaburna AFS. The layour of the notabook will be coordinated with the public affairs office and TFM. Assume a maximum of one (1) update (Seq. no. 3).
- 1.3.1.4 Mailing List. In coordination with the base Community Relations office and the TPM, prepare and update the mailing list on a quarterly basis. Assume a maximum of two (2) updates (Seq. no. 3). 1.3.1.5 Mans. Prepare presentation quality maps of the installations and their sites to use in newsletters and to distribute to the
- 1.3.2 Literature Secret. Conduct a literature search and analyze aerial photos of the DEW Line Sties to supplement existing information that has been collected. The purpose of the literature search is to complete the

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conceptual site model so that a numerical estimate of risk can be developed.

- 1.3.3 Presurvey. Within eight weeks of the issuance of an order, the contractor shall visit the Dew Line Sites and Cape Lieburne to ensure complete understanding of site conditions. Coordinate this visit with the TPM and the 11 CEOS project manager. The contractor shall look for evidence of contamination at each site visited (e.g., leaking drums, vegetative stress, leachate seeps). The contractor shall observe the physical settings of each site visited to formulate specific recommendations concerning boring placement, use of geophysical techniques, and other aspects of the proposed field investigation. The findings of the presurvey shall be used to prepare the Work Plan. SAP, and HSP for the RI and to prepare acoping documents for the treatability study (iss). Assume one presurvey and one reconnaisance
- Quality Assurance/Quality Control (QA/QC). A QA/QC program shall be conducted and documented for all work pursuant to this delivery order. Contractor and project-specific documents concerning QA/QC procedures and requirements shall be strictly followed. Data generated under the QA/QC program shall be used by the contractor for svaluating the analytical results and field records assembled for each site to identify accurate and validated data that may be used to assess risk, develop conceptual site models and evaluate alternatives.
- 1.3.5 Conceptual Sits Model. Use all available RI/FS data supported by acceptable QA/QC results (as measured against QAPP requirements) and site characterization information to refine, based on newly collected data, the conceptual site model. The model shall define the nature and extent of contamination and the transport and fate of those contaminants. The minimum requirements of the model are given in section 2 of the Handbook. The complexity and detail of the site model shall be consistent with the nature of the site and site problems, and the amount of data available the conceptual
- 1.3.6 ARRE Evaluation. The contractor shall identify all Applicable or Relevant and Appropriate Requirements (ARAR). These ARARs will

Project Deliverables

Deliver the following documents in compliance with the requirements of item VI, the formats required in section 1 and 4 of the Handbook, and the specifications noted below. Draft raports are considered "drafts" only because they have not been reviewed and approved by the Air Force. In all other respects, 'drafts' shall be complete, in the proper format, fully illustrated, and free of grammatical and typographical errors.

secping Documents.

- a. Engineering Network Analysis (GANTY) (para 1.2.1). Provide within ten (10) days after the issuance of an order. Update and submit quarterly
- b. Work Plan (para 1.2.2). Use the format in section 1 of the Handbook (sequence 4, para 6.1).
- c. Sampling and Analysis Plan (1.2.3). Use the format in section 1 of the Handbook (sequence 4, para 6.1).

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- d. Health and Safoty Plan (pers 1.2.4). Provide within six (6) weeks after the issuance of an order (sequence 4, para 6.1).
- e. Community Selations Plan (pera 1.2.5). Provide within eight (8) weeks after issuance of an order (sequence 4, para 6.1).
- 1.4.2 Special Notification. Provide written notification of imminant health hazards and supporting documentation within three (3) days of telephone notification (sequence 15, para 6.1).
- 1.4.3 Presentation Materials. The contractor shall propers and present up to two (2) presentation packages at meetings coordinated by the Air Force (sequence 9, para 6.1). Attendance of these meetings is included in paragraph 1.1.3 of this SOW. As part of the presentation materials, the contractor shall provide paper copies of all slides and overheads.
- 1.4.4 Masting summarise (para 1.1.3). Provide no later than five (5) days after conclusion of each meeting (sequence 18, para 6.1).
- 1.4.5 Mewslatter. Frepare and submit a quarterly newslatter which presents the status of the entire base IRP Program. This will include preparing an outline resulting from input by all contractors involved in the program. The outline must be approved by the base and TFM prior to submittal of the newsletter. The final product will be printed and distributed as agraed to by the TPM. Assume a maximum of two (2) newsletters (Sequence no. 3).
- 1.4.6 Face Sheets. As required by the base IRP Program. prepare and submit fact sheets which facilitate the public's understanding of the IRP Program. These sheets should include key community concerns regarding sites as specified by the base. Use the format agreed to by the base and TPM. Print and distribute the fact sheets as agreed to by the TPM. Assume a maximum of two (2) fact sheets (Sequence no. 3).
- 1.4.7 Fublic Motices. In accordance with paragraph 1.3.6.2, prepare and submit public notices for the Fairbanks and local newspapers. Use the format agreed to by the base and TPM (Sequence no. 3).
- 1.4.8 Photo Notabook. In accordance with paragraph 1.3.6.3, develop a photo notebbok which focuses on the overall base IRP Program. Prior to implementation, submit a conceptual layout of the notebook for review by the
- 1.4.9 Mailing List. In accordance with the base Community Relations coordinator and paragraph 1.3.6.4, update the existing mailing list on a quarterly basis (Sequence no. 3).
- 1.4.10 Maps. In accordance with the base community Relations coordinator and paragraph 1.3.6.5, prepare presentation quality maps.
- sita Location and Datos

Daw Line Sites and Cape Lisburne, date to be established.

- Base support The base will:
- 3.1 Provide the contractor with existing engineering plane, drawings, diagrams, aerial photographs, digitized map files, etc., to facilitate: evaluation of IRF sites under investigation.

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- 3.2 Arrange for personnel identification badges, vehicles passes, and/or entry permits with the contention the contractor will provide necessary information to the base personnel no less than four weeks before needed.
- 3.3 Provide the contractor with all previously approved documents which provide information on all IRP efforts conducted at Dew Line Sites and Cape analyses which need to be conducted.
- IV. Government Yurnished Property

See above in section III.

- V. Government Points of Contact:
- 5.1 MAJCOM Coordinator

Major James R. Williams III AFCEE/ESRU 8001 Inner Circle DR STE 2 Brooks AFB TX 78235-5328 (210) 536-5243 DEN 240-5243 (210) 536-9026 FAX DSN 240-9026

5.2 Restoration Team Chief

Mr. Marty M. Fails AFCZE/ESRU 8001 Inner Circle DR STE 2 Brooks AFB TX 78235-5328 (210) 536-5243 DEN 240-5243 (210) 536-9026 FAX DEN 240-9025

5.3 Rase Point of Contact (POC)

Mr. Jim Wolfe 11 CEOS/DEVR 21885 Second Street Elmendorf AFB AK 99506-4420 (907) 552-4532 DEN 317-552-4532 (907) 552-1533 PAK DEN 317-552-1533

5.4 Public Affairs Coordinator

Ms. Wenda Wolf 11 CEOS/DEVR 21885 Second Street Elmendorf AFB AK 99505-4420 (907) 552-4532 DSN 317-552-4532 (907) 552-1533 FAX DSN 317-552-1533

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- vę. Deliverables
- 6.3 Attachment 1 of the Besic Centract

Sequence numbers 1 and 5 listed in attachment 1 to the basic contract app. all orders. Guidance for preparing RED Status Reports (sequence 1) is contained in the Handbook, section 4. In addition, the sequence numbers as dates listed below are applicable to this order:

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- 6.2 Rosorvod.
- 6.3 Macas
 - e. Submit Quarterly Thereafter.
- b. One (1) first draft plan (8 copies), one (1) second draft plan (8 copies), and one (1) final plan (10 copies) are required. Incorporate Air Force comments into the second draft and final plan as specified by the TPM. Supply AFCEE/ESR with an advance copy of the first draft, second draft, and final plan for acceptance prior to distribution. Distribute the remaining copies of each plan as specified by the TPM. The second and final reports shall be submitted within three (3) weeks of receipt of comments from the TPM.
- c. Primary and Secondary Documents. One first draft report (25 copies), one second draft report (25 copies), and one final report (35 bound copies plus the original camera-ready copy and a 3.5 inch disk formatted in WordPerfact 5.1 containing the document file) are required. Incorporate Air Force comments into the second draft and final reports as specified by the TFM. Supply the TFM with an advance copy of the first draft, second draft, and final reports for acceptance prior to distribution. Distribute the remaining
- Provide written notice with supporting documentation within three (3) days of telephone notification and at the direction of the TPM. Assume a maximum of 100
 - Provide within one (1) week of task/meeting completion.
- f. Provide 500 copies of the Newsletters and distribute as agreed to by the TPM. This includes mailing the final product to on-base personnel and addresses on the existing mailing list.
- g. Provide draft and final deliverables. Provide two advance copies to the AFCEE TFM and to the 11 CEOS Community Relations Coordinates for acceptance prior to preparation of the final deliverables.
 - h. Provide poster-size map.

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16. CONTRACTOR/OFFEROR IS TO SIGN THIS DOCUMENT	NOT REQUIRED	CONTRACTO	DRIOFFEROR IS COPIES TO 22. UNITED BY ED 23. NAME C	REQUIRED TO SIGN THE	Signature of Control	eceng Officer)	24 DATE SIG

- 1. Pursuant to the "Changes" Clause of Section I of the basic contract. The ceiling amount for the order is increased by \$99,986. from \$299, 855. to \$399,841. The performance period remains the same, 31 DEC 93, as a result of this change.
- 2. As a result of paragraph 1 above, said order is more specifically modified as follows:
- a. <u>SECTION A Cover page</u> The NTE amount in Block 20 (Cover Page) is increased by \$99,986. from \$299,855. to \$399,841.
 - b. <u>SECTION B Supplies and Services Establish Special ACRN XA.</u>

Item No	<u>Supplies/Services</u>	Quantity Purch Unit	Unit Price Total Item Amt
0001	CLIN Change sec class: U		N N
	noun: SAMPLING, ANALYSIS, AND DATA acrn: XA nsn: N site codes pqa: D acp: D fob: D type contract: Y		
0002	CLIN Change sec class: U noun: SUPPORT acrn: XA nsn: N		N N
	<pre>site codes pqa: D acp: D fob: D type contract: Y</pre>		

- c. <u>SECTION C Description/Specs/Work Statement</u> The SOW for this order remains the same as the Basic order entitled, "Installation Restoration Program/Remedial Investigation/Feasibility Study for Distant Early Warning (DEW) Line Sites and Cape Lisburne AFS, AK" dated 16 MAR 93.
- d. <u>SECTION F Supplies Schedule Data</u> is modified to include ACRN AB and Special ACRN XA.

Item No	Supplies Schedule Data		Delivery Quantity	Schedule Date
0001	CLIN Del Sch Change acrn: XA ship to: U	sec class: U	1	9 3DE C31

0002

CLIN Del Sch Change sec class: U

acrn: XA ship to: U

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93DEC31

e. SECTION G. - Accounting Classification Data - is amended as set forth below:

Appropriation/Lmt Subhead/CPN Recip DODAAD Obligation ACRN Acct Class Data Supplemental Accounting Classification **Amount**

ACCOUNT ESTABLISH AB

UNCLASSIFIED 5733400 F74400

\$99,986.00

303 7434 434419 000007 53440 000000 674400

pr/mipr data: FY7624-93-08305

SPECIAL ACRN ESTABLISH XΑ UNCLASSIFIED

> descriptive data: Special ACRN XA funds CLINs 0001 and 0002 and includes the following:

ACRN AA: \$299,855. AB: \$ 99.986. TOTAL \$399,841.

Finance Officer: Pay Funds in Alphabetical Order.

3. This supplemental agreement constitutes full settlement of any claims of the contractor under the contract, including the clause entitled, "Changes", arising out of or in connection with the changes effected hereby.

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AMENDMENT	OF SOLICITATION/MODIFICATI	ON OF CONTRACT	PAGE 1 OF 3
PROC INSTRUMENT ID NO. (PIIN)	J. SPIIN 4. EFFECTIVE DATE	5. REQUISITION/PURCHASE REQUE PROJECT NO.	est e. BCC/DMS RATING
F33615 -90-D -4010	002202 93JUL23	FY7624-93-08353	
DEPARTMENT OF THE AIR FORCE MATERIE HUMAN SYSTEMS CEN 8005 9TH STREET BROOKS AFB TX 782 Buyer: REBECCA ROU Phone: (210) 536-4	AIR FORCE D L COMMAND A TER/PK 2 T 35-5353 NSAVILL/PKVBA	CMAO, BALTIMORE TTN: CHESAPEAKE 00 TOWNSONTOWN BLV OWNSON MD 21204-52	VD, WEST
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		INC L. FALCE INTER 12TH FLOOR	3 SEE DAYS SECT 'E' 12. PURCHASE OFFICE POINT OF CONTACT
	PITTSBURGH PA		MVX/M6V/MVY
THE ABOVE NUMBERED CONTRADATA, ETC.) SET FORTH HEREIN. THIS SUPPLEMENTAL AGREEME THOOIFIES THE ABOVE NUMBE THIS MODIFICATION IS ISSUED F 15. CONTRACT ADMINISTRATION DATA A KIND B. MOD ABST C. DO OF MOD RECIPIENT ADP PT	ANT TO LIN ARE MADE TO THE ABOVED NUMBERED CO ACT IS MODIFIED TO REFLECT THE ADMINISTR. NOT IS ENTERED INTO PURSUANT TO AUTHORI RED CONTRACT AS SET FORTH HEREIN.	Changes - Time a: 1987)	nd Materials or Labor
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18. CONTRACTOR/OFFEROR IS I		RVOFFEROR IS REQUIRED TO SIGN THIS DI COPIES TO ISSUING OFFICE	OCUMENT AND RETURN
TO SIGN THIS DOCUMENT 19. CONTRACTOR/OFFEROR (Signature	re of person authorized to sign)	22. UNITED STATES OF AMERICA (Signal	mature of Contracting Officer)
BY 20. NAME AND TITLE OF SIGNER (Type or	print) 21. DATE SIGNE	D 23. NAME OF CONTRACTING OFFICER	(Type or print) 24. DATE SIGNED
		GARY J. MACDECY	93 Jul 23

- 1. Pursuant to the "Changes" Clause of Section I of the basic contract. The ceiling amount for the order is increased by \$2,899,511.00 from \$399,841.00 to \$3.299,352.00. The performance period is changed to 94 Feb 15, as a result of this change.
- 2. As a result of paragraph 1 above, said order is more specifically modified as follows:
 - a. <u>SECTION A Cover page</u> The NTE amount in Block 20 (Cover Page) is increased by \$2,899,511.00 from \$399,841.00 to \$3,299,352.00.
 - b. <u>SECTION B Supplies and Services</u> Establish Special ACRN XA.

<u>Item No</u>	<u>Supplies/Services</u>	rți	Quantity Purch Unit	Unit F Total Ite	
0001	CLIN Change	sec class: U			N N
	noun: SAMPLING, ANAL	YSIS AND DATA			.,
	site codes pqa: D type contract: Y	acp: D fob: D			
0002	CLIN Change	sec class: U			N N
	noun: SUPPORT acrn: XA nsn: N site codes pqa: D type contract: Y	acp: D fob: D			
0004	CLIN Establish	sec class: U		l LO	N N
	noun: CHEMICAL ANAL' acrn: XA nsn: N site codes pqa: D pr/mirp Data: FY762 type contract: Y	acp: D fob: D			

c. <u>SECTION C - Description/Specs/Work Statement</u> - The SOW for this order entitled, "Installation Restoration Program Remedial Investigation/Feasibility Study, Stage 1, Distant Early Warning (DEW) Line Sites and Cape Lisburne AFS, AK", dated 6 JUL 93 is attached hereto as Attachment #1 to this modification.

d. <u>SECTION F - Supplies Schedule Data</u> is modified to include ACRN AB and Special ACRN XA.

Delivery Schedule Date Quantity Supplies Schedule Data Item No sec class: U CLIN Del Sch Change 0001 acrn: XA 1 95JANØ1 ship to: U sec class: U CLIN Del Sch Change 0002 acrn: XA 1 95JANØ1 ship to: U s**ec** class: U CLIN Del Sch Establish 0004 acrn: XA 1 9**5JANØ1** ship to: U

e. <u>SECTION G - Accounting Classification Data</u> - is amended as set forth below:

ACRN Acct Class data Supplemental Accounting Classification Amount

AB ACCOUNT CHANGE UNCLASSIFIED 5733400 F74400 \$2,899,511.00+ pr/mipr data:

XA SPECIAL ACRN CHANGE UNCLASSIFIED

descriptive data: Special ACRN XA funds CLINs 0001, 0002 and 0004 and includes the following:

ACRN AA: \$ 299,855.00

AB: \$ 99,986.00 (MOD 0022-01) \$2,899.511.00 (MOD 0022-02) TOTAL \$3,299,352.00

FINANCE OFFICER: Pay funds in alphabetical order.

3. This supplemental agreement constitutes full settlement of any claims of the contractor under the contract, including the clause entitled, "Changes", arising out of or in connecting with the changes effected hereto.

1993 JUL 6

STATEMENT OF WORK INSTALLATION RESTORATION PROGRAM REMEDIAL INVESTIGATION/FEASIBILITY STUDY

STAGE 1

DISTANT EARLY WARNING (DEW) LINE SITES and CAPE LISBURNE AFS, AK

I. DESCRIPTION OF WORK

1.1 Scope

1.1.1 Background. The objective of the Air Force Installation Restoration Program (IRP) is to assess past hazardous waste disposal and spill sites on Air Force installations and develop remedial actions consistent with the National Contingency Plan (NCP) for those sites which pose a threat to human health and welfare or the environment. This objective is achieved through a Remedial Investigation Feasibility Study (RI/FS) process in which conclusions and recommendations drawn from accurate and validated data are used to structure and guide subsequent activities.

The RI/FS process includes scoping to define data requirements and objectives, a remedial investigation to characterize sites for a baseline risk assessment, and a feasibility study to define and evaluate alternative remedial actions so that a recommended action may be selected. Each of these steps of the RI/FS process can be conducted in stages that focus on particular aspects of the process.

The contractor shall accomplish the actions described in this Statement of Work (SOW) to complete the RI/FS process at the following seven Dew Line Sites and Cape Lisburne:

Barter Island AFS (BAR-M); Bullen Point AFS (POW-3); Point Lonely AFS (POW-1); Point Barrow AFS (POW-M); Point Lay AFS (LIZ-2); Wainwright AFS (LIZ-3); and Oliktok Point AFS (POW-2).

- 1.1.2 Requirements for Project Activities. The Installation Restoration Program (IRP) Handbook referenced in this Statement of Work provides requirements for laboratory and field activities and applicable formats for project documents that shall be used by the contractor. Volume 1 of the Handbook dated May 1992 is provided under separate cover. This document is referenced in this Statement of Work as the Handbook. The contractor is responsible for the thorough knowledge and understanding of the previous findings and recommendations that affect this task prior to the start of field activities. The documents involved include but are not limited to the IRP Phase I Records Search, and the IRP Phase II plans and reports addressing the Dew Line Sites and Cape Lisburne.
- 1.1.3 Meetings. A maximum of two (2) contractor personnel, including the project leader, shall attend four (4) eight (8) meetings at Elmendorf AFB, AK. Each meeting shall be two (2) 8-hour workdays in duration. All meetings shall be coordinated by the Restoration Team Chief (RTC).
- 1.1.4 Special Notifications. The contractor shall immediately report to the RTC, or designate, via telephone, any data or results generated during this investigation which may indicate an imminent health risk. Following this telephone notification, a written notice shall be prepared and

delivered within three (3) days. This notification shall include supporting documentation (sequence 16, para 6.1)

1.2 Project Scoping Documents

The purpose of the project scoping documents is to clearly and comprehensively define project activities prior to the initiation of field work. The contractor shall prepare and submit the following project scoping documents for this task prior to the initiation of any field activities or laboratory analyses.

- 1.2.1 Engineering Network Analysis. Provide within ten (10) days after the issuance of an order a computer generated network analysis which is a detailed task plan for the RI/FS work efforts. The network analysis (GANTT) chart shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of work scheduled for completion by any given date during the period of the delivery order. The network analysis (GANTT) shall show both serial and parallel subtasks leading to a deliverable product or report, and shall show early and late start and completion dates with float. The network analysis (GANTT) shall be updated and submitted quarterly (sequence 3, para 6.1).
- 1.2.2 Work Plan. This section will discuss the overall approach, (including a brief summary of the Conceptual Site Model and Data Quality Objectives), major tasks, scope, timeline, and major decision points. Due to the extreme remoteness of the Dew Line Sites and Cape Lisburne, the contractor shall include a detailed plan for logistics and strategy to complete the RI/FS field activities. Follow the format specified in section 1 of the Handbook. In preparing the Work Plan, use previous reports and the information gathered during the literature search and presurvey along with experience at similar sites. Reevaluate the recommendations for Dew Line Sites and Cape Lisburne developed during previous IRP stages (sequence 4, para 6.1).
- 1.2.3 Sampling and Analysis Plan (SAP). The SAP consists of a quality assurance plan (QAPP) and a Field Sampling Plan (FSP). Prepare a SAP describing how project activities will be accomplished in the format specified in section 1 of the Handbook. Incorporate review comments and obtain RTC concurrence prior to the start of field activities (sequence 4, para 6.1).
- 1.2.4 Health and Safety Plan (HSP). Provide a written Health and Safety Plan within eight (8) weeks after the issuance of an order. The contractor shall comply with USAF, OSHA, EPA, state, and local health and safety regulations regarding the proposed work effort. Use EPA guidelines for designating the appropriate levels of protection needed at the study sites. The Health and Safety Plan shall provide no less protection than the protection contained in the manual entitled "Health and Safety Requirements for Employees Engaged in Field Activities" dated 1981 and the "Occupational Safety and Health Manual for Hazardous Waste Sites Activities" dated 1985 and 29 CFR 1910. Coordinate the Health and Safety Plan directly with applicable regulatory agencies prior to submittal to AFCEE/ESR. The contractor shall certify to AFCEE/ESR that the contractor has reviewed the coordinated Health and Safety Plan with each employee and also subcontractor's employees prior to the time each employee engages in field activities (sequence 4, para 6.1).
- 1.2.5 Community Relations Plan. The contractor shall prepare a Community Relations Plan (CRP) for the DEW Line Sites and Cape Lisburne AFS outlining the specific public communications and involvement techniques to be used in coordination with remedial site activities (sequence 4, para 6.1). Follow the guidance contained in "Community Relations in Superfund, a Handbook", office of Solid Waste and Emergency Response (OSWER) Directive

9230.0-03C (EPA/540/R-92/009, January 1992, PB92-963341), and other applicable directives. Also, use as a guidance previously accomplished CRP from other installations in Alaska. Appropriately adapt such guidance to the local situation at the DEW Line Sites and Cape Lisburne. As described in OSWER Directive 9230.0-03C, the CRP shall include, but not be limited to, a description of the sites and the community, an overview of the community involvement to date, key community concerns regarding the site and AF site activities, and suggested community relations activities. A contact list of elected officials, agency representatives, and interested groups and individuals shall be included in appropriate copies of the plan. In addition, the plan will include suggested locations for meetings and information repositories. Contractor activities to develop the CRP shall include conducting a review of site information provided by the AF.

1.3 Project Activities

The contractor shall conduct the following tasks to achieve the purposes stated herein, in compliance with approved scoping documents, the Handbook, and all applicable regulations and requirements.

- 1.3.1 Community Relations. Provide support to the base public affairs office for the tasks described below pertaining to the RI/FS Community Relations Program.
- 1.3.1.1 <u>Public meetings and workshops</u>. The contractor shall be responsible for coordinating public meetings and workshops for all DEW Line Sites and Cape Lisburne AFS. This includes producing briefing scripts, slides and any associated products such as response cards and sign-in sheets. As requested by the base Community Relations office in coordination with the RTC, research and provide materials for public queries, news media queries, and news releases. Assume a maximum of one (1) workshop/meeting (Seq. nos. 3,9).
- Relations office and the RTC, the contractor shall prepare and publish public notices for the Fairbanks and local newspapers. The purpose of these notices is to inform the public of a meeting, workshop, or comment period in which they have the opportunity to be involved in the IRP Program at DEW Line Sites and Cape Lisburne AFS. Also, these notices may be utilized to inform the public of other pertinent program information such as quarterly notices of documents placed in the information repositories. The format for the notices shall be coordinated with the Community Relations office and RTC, and then submitted to the RTC for review prior to delivery to the base. Assume a maximum of two (2) notices (Seq. no. 3).
- 1.3.1.3 <u>Photo Notebook.</u> The contractor shall develop a photo notebook which focuses on the overall IRP program at DEW Line Sites and Cape Lisburne AFS. The layout of the notebook will be coordinated with the public affairs office and RTC. Assume a maximum of one (1) update (Seq. no. 9).
- 1.3.1.4 Mailing List. In coordination with the base Community Relations office and the RTC, prepare and update the mailing list on a quarterly basis. Assume a maximum of two (2) updates (Seq. no. 3).
- 1.3.1.5 <u>Maps.</u> Prepare presentation quality maps of the installations and their sites to use in newsletters and to distribute to the public.

- 1.3.1.6 <u>Information Repository/Administrative Record</u>. Prepare a listing of all documents required for the Information Repository and Administrative Record. Create an Informatin Repository and Administrative Record. The Repository and Record will be maintained by the 11 CEOS/CEVR Community Relations Coordinator. Assume two locations for the Repository and Record, one in Anchorage and another in Elmendorf AFB, AK. Actual locations will be determined by the 11 CEOS/CEVR Community Relations Coordinator.
- 1.3.2 Literature Search. Conduct a literature search and analyze aerial photos of the DEW Line Sties to supplement existing information that has been collected. The purpose of the literature search is to complete the conceptual site model so that a numerical estimate of risk can be developed.
- 1.3.3 Presurvey. Within eight weeks of the issuance of an order, the contractor shall visit the Dew Line Sites and Cape Lisburne to ensure complete understanding of site conditions. Coordinate this visit with the RTC and the 11 CEOS project manager. The contractor shall look for evidence of contamination at each site visited (e.g., leaking drums, vegetative stress, leachate seeps). The contractor shall observe the physical settings of each site visited to formulate specific recommendations concerning boring placement, use of geophysical techniques, and other aspects of the proposed field investigation. The findings of the presurvey shall be used to prepare the Work Plan, SAP, and HSP for the RI and to prepare scoping documents for the treatability study(ies). Assume one presurvey and one reconnaisance trips.
- 1.3.4 Quality Assurance/Quality Control (QA/QC). A QA/QC program shall be conducted and documented for all work pursuant to this delivery order. Contractor and project-specific documents concerning QA/QC procedures and requirements shall be strictly followed. Data generated under the QA/QC program shall be used by the contractor for evaluating the analytical results and field records assembled for each site to identify accurate and validated data that may be used to assess risk, develop conceptual site models and evaluate alternatives.
- 1.3.5 Conceptual Site Model. Use all available RI/FS data supported by acceptable QA/QC results (as measured against QAPP requirements) and site characterization information to refine, based on newly collected data, the conceptual site model. The model shall define the nature and extent of contamination and the transport and fate of those contaminants. The minimum requirements of the model are given in section 2 of the Handbook. The complexity and detail of the site model shall be consistent with the nature of the site and site problems, and the amount of data available the conceptual site model shall be documented in the Work Plan.
- 1.3.6 ARARS Evaluation. The contractor shall identify all Applicable or Relevant and Appropriate Requirements (ARAR). These ARARS will be documented in the Work Plan.
- 1.3.7 Data Collection, Sampling, and Analysis Procedures. The contractor shall conduct field activities, sampling, laboratory analysis, and data quality assessment. Section 2 of the Handbook is recommended for the contractor to follow. The contractor shall conduct all activities in accordance with the WP and the SAP approved by the COR. The COR shall be notified in writing of any planned deviation from the activities specified in these documents. COR approval of deviations is required prior to performance.

The field investigation (including all drilling and sampling operations) shall be supervised by a registered geologist, hydrogeologist, or professional engineer. If required by the state, the on-site field supervisor shall be

certified by the state to install test wells. A detailed log of field conditions, materials penetrated during drilling, well completion, and sampling conditions, as described in Section 2 of the Handbook, shall be maintained and made available for Government inspection upon request. Decisions on well and boring locations, well depths, screened intervals, and all details of the field investigation shall be made by the COR, and the contractor's field or project supervisor.

1.3.8 Regulatory Requirements and Permits. All well drilling, development, sampling, laboratory analysis, and other activities pursuant to this effort shall be conducted in strict accordance with all applicable federal and state laws, ordinances, rules and regulations, and all authorities with jurisdiction over such activities. The contractor shall complete permits, applications, other documents, and proficiency tests required by the regulatory agencies. The contractor shall file documents with appropriate agencies and pay all applicable permit and filing fees. The contractor shall identify locations requiring permits to Radar Station Manager. The contractor shall include all correspondence in appendices to the technical reports in accordance with Section 4 of the Handbook.

All laboratory analyses shall conform to all applicable federal, state, and local regulatory agency requirements. If the requirements specify that certification is necessary to conduct one or more specific analyses, the contractor shall furnish documentation showing laboratory certification with the first set of analytical data supplied to AFCEE/ESR and the COR.

The contractor shall containerize and sample materials suspected to be hazardous in accordance with applicable requirements, Guidance from the Handbook, and the approved Plans. The contractor shall transport these containerized materials to a location within the installation boundary designated by the Radar Station Manager at a frequency specified by the Station Manager. The contractor shall handle, store, and/or dispose of potentially hazardous materials. The contractor shall transport and empty containerized materials determined not to be hazardous to locations within the installation boundary identified by the Station Manager.

- The contractor shall conduct a Remedial Investigation (RI). 1.3.9 RI to characterize environmental conditions; define the concentration, nature, and extent of contamination; and quantitatively estimate the risk to human health and the environment and study the area through the collection of geologic and hydrologic data, environmental samples, the laboratory analyses of those samples for potential contaminants, the evaluation of the analytical results and field measurements with respect to quality control data, and the interpretation and analysis of accurate and precise data. The purpose of data collection, sample collection, and laboratory analysis is to determine whether any contaminants generated from installation activities have entered the environment. The field investigation is used to determine the source of any identified contaminants, the magnitude of contamination relative to Applicable or Relevant and Appropriate Requirements (ARARs), and any naturally occurring or background concentrations for specific compounds. The RI shall comply with the specifications, procedures, and methodologies presented in the projectspecific SAP. The COR must be notified in writing prior to any modification of or deviation from any activity described in these documents.
- 1.3.9.1 Soil Borehole Drilling and Sampling and Well Installation and Sampling. The contractor shall drill and collect samples from boreholes as specified in the SAP. The contractor shall evaluate the need to install, sample, and develop monitoring or extraction wells.

- 1.3.9.1.1 Lithologic Samples. The contractor shall describe core samples at least every five (5) feet of drilling or at each change in lithology, whichever is less, to indicate significant changes in lithology of characteristic properties that relate to the strata penetrated. Any deviations shall be coordinated with the COR. Guidance for standard identification practices are found in the Handbook. The contractor shall include in the field logbook observations made by the driller and rig geologist during drilling such as depth to water, penetration rate, drill rig behavior, and other observations that might be indicative of changes in formation characteristics. The contractor shall record depth to permafrost in all the soil borings and shall not proceed beyond five (5) feet into the permafrost layer.
- Drill Cuttings and Drilling Fluids. The contractor 1.3.9.1.2 shall containerize all drill cuttings and drilling fluids. All drill cuttings and drilling fluids shall be managed and disposed of in accordance with the project SAP. (Note: The contractor shall be responsible for providing all necessary containers.) The contractor shall be responsible for the logistics of the ultimate disposal of all drill fluids or drill cuttings deemed hazardous in accordance with current EPA off-site disposal policy and state and/or local hazardous waste disposal laws. The contrator shall coordinate with the Station Manager for on-site placement and disposal of all drill cuttings, fluids, purge fluid, and excavated material. If on-site disposal is excluded, all hazardous waste shall be transported by a permitted hazardous waste transporter to a licensed Resource Conservation and Recovery Act (RCRA) approved facility and be accompanied by a Uniform Hazardous Waste Manifest. The contractor shall provide a final, completed copy of the hazardous waste manifest to the 11 CEOS/CEVR. The Radar Stations' hazardous waste managers will sign all hazardous waste manifest documents.
- 1.3.9.1.3 Well/Boring Precautions. The contractor shall mark the field locations of all borings during the planning/mobilization phase of the field investigation. The contractor shall consult with base personnel to minimize the disruption of base activities, to properly position wells with respect to site locations, and to avoid penetrating underground utilities. The contractor shall obtain all permits prior to commencement of digging and drilling operations. The contractor shall utilize a registered land surveyor in determining the elevations and locations of all off-base background study borings. All borings and wells from which samples are taken shall be surveyed by the contractor for vertical and horizontal control. The contractor shall record the positions on project and site specific maps. Bench marks used must have been previously established from and be traceable to a U. S. Coast and Geodetic Survey (USCGS) or U. S. Geological Survey (USGS) survey marker. Clearly identify all bench mark locations on the base map.
- 1.3.9.1.4 Water-Level Measurements in Boreholes. The contractor shall measure water levels in all boreholes after the water level has stabilized. Include this information and the date of measurement in the boring logs. Also, record soil moisture conditions (moist, wet, saturated, etc.) in the boring log.
- 1.3.9.1.5 Air Monitoring During Drilling. The contractor shall monitor the ambient air in the breathing zone above the borehole during all drilling with an appropriate organic vapor analyzer to identify potentially hazardous and/or toxic vapors. Include air monitoring results in borehole logs.

- 1.3.9.1.6 Subsurface Soil Sampling. The contractor shall collect soil samples from borings as specified in the SAP. The SAP specifies the analytical methods, the parameters for analysis, and the estimated number of analyses for soil samples.
- 1.3.9.1.7 Well Construction Requirements. The contractor shall coordinate with the COR to determine well completion requirements (flush or projected above ground surface). All wells shall be secured as soon as possible after drilling. The contractor shall provide corrosion resistant locks for both flush and above-ground well assemblies. The locks shall be compatible with existing wells. The contractor shall turn the lock keys over to 11 CEOS/CEVR POC following completion of the field effort. The contractor shall coordinate with the 11 CEOS/CEVR POC, the RTC, and the COR the selection of exact well and screen placement, gravel pack design, and screen slot size.
- 1.3.9.1.8 Well Logs. For each well, the contractor shall prepare a well completion log and schematic diagram showing well construction details. Lithologic descriptions, well elevation survey data, and other information included in the well logs shall conform to the specifications of the SAP.
- 1.3.9.1.9 Well Development. The contrator shall develop each well as soon as possible. Guidance for well development procedures are found in the the Handbook. The contractor shall measure the rate of water production, pH, specific conductance, and water temperature during well development.
- 1.3.9.1.10 Well Placement. The contractor shall avoid installing wells in depressions or areas subject to frequent flooding and/or standing water. If wells must be installed in such areas, the contractor shall design the wells so standing water does not leak into the top of the casing or cascade down the annular space.
- 1.3.9.1.11 Well and Borehole Clean-up. The contractor shall clean the area following the completion of each well and borehole. The contractor shall return all sites to the original condition of the site.
- 1.3.9.1.12 Groundwater and Surface Water Sampling. The contractor shall collect groundwater and Surface Water samples from newly developed well and existing wells and from surface water bodies. The SAP shall specify the analytical methods, the parameters for analysis, and the estimated number of analyses for groundwater and surface water samples.
- 1.3.9.1.13 Composite Sampling. The contractor shall collect and analyze drill cuttings, fluids, purge fluids, and excavated material. The SAP shall specify the analytical methods, the parameters for analysis, and the estimated number of analyses for composite samples.
- 1.3.9.2 Geophysical Surveys. The contractor shall evaluate whether geophysical surveys are needed (e.g., to determine boundaries of landfills, to locate underground debris, utilities and storage tanks). Where geophysical surveys are appropriate, the contractor shall select a geophysical survey technique or techniques [such as ground penetrating radar (GPR), magnetometer or electromagnetic surveys (EM)] that will best meet the desired application. The technique(s) used shall be approved by the RTC prior to use. Approximate number of surveying days is included in Annex A which is to be used for costing purposes only. Appropriate grid systems shall be established and the contractor shall use the results of this survey to prepare a contour map of the results. Provide this map as an attachment to the first R&D Status Report

submitted after the completion of the geophysical surveys. The contractor shall perform the geophysical surveys before drilling and use the results in selecting the location of soil borings, wells, test pits, if necessary.

- 1.3.9.3 Permeability Testing. The contractor shall determine the need for a permeability test at Cape Lisburne AFS, to provide additional data on the hydrogeologic characteristics of the water table aquifer. The SAP shall specify the method to be used for the permeability test.
- 1.3.9.4 Water Level Measurement. The contractor shall evaluate the need for conducting a complete round of water level measurements in all existing and new wells at Cape Lisburne AFS at the beginning of field work and during the field sampling effort. Data gathered shall be used for interpreting groundwater flow directions and groundwater gradient.
- 1.3.9.5 **soil Gas Surveys**. The contractor shall evaluate the need for soil gas surveys and Hydropunch (e.g., to select soil boring locations). If soil gas surveys and hydropunch are included as part of the approved Work Plan and FSP, the contractor shall establish appropriate grid systems. The contractor shall prepare a posting map of soil gas values relative to their location on the grid used. Provide this map as an attachment to the first R&D Status Report submitted after completion of the soil gas survey (sequence 3, para 6.1). Approximate number of surveying days are included in Annex A which is to be used for costing purposes only.
- 1.3.9.6 Groundwater Field Screening. The contractor shall perform groundwater field screening. The SAP shall specify the method, location, and type of groundwater field screening.
- 1.3.9.7 Baseline Risk Assessment. The contractor shall use data supported by acceptable QA/QC results (as measured against QAPP requirements) and the conceptual site model to numerically estimate the risk posed by site contaminants to human health and the environment. The contractor shall identify and list all ARARs for those contaminants detected in environmental samples at the site. The contractor shall provide all ARARs evaluations as an attachment to the Technical Report. Provide the results of the baseline risk assessment in the Technical Report using the formats in Section 4 of the Handbook as a guidance.

The contractor shall identify those sites posing minimal or no threat to human health, welfare, or the environment and for which no further action is appropriate.

The contractor shall use the results of the risk assessment in establishing remedial action objectives and developing remedial alternatives in the Feasibility Study.

- 1.3.9.8 **Defense Priority Model Scores.** The contractor shall use the Defense Priority Model to score the sites. The score shall be included as an appendix to the RI/FS Technical Report.
- 1.3.9.9 Fate and Transport. The contractor shall perform fate and transport modeling for contaminants of interest to include the projection of future contaminant concentrations within the boundaries of the site. This will be done in conjunction with the RI/FS report.

1.3.13 Weekly Field Activity Report

The confractor shall transmit a Weekly field activity report. The AFCEE RTC shall develop the format for the report.

1.4 Project Deliverables

Deliver the following documents in compliance with the requirements of item VI, the formats required in section 1 and 4 of the Handbook, and the specifications noted below. Draft reports are considered "drafts" only because they have not been reviewed and approved by the Air Force. In all other respects, "drafts" shall be complete, in the proper format, fully illustrated, and free of grammatical and typographical errors.

1.4.1 Scoping Documents.

- a. <u>Engineering Network Analysis (GANTT)</u> (para 1.2.1). Provide within ten (10) days after the issuance of an order. Update and submit quarterly (sequence 3, para 6.1).
- b. Work Plan (para 1.2.2). Use the format in section 1 of the Handbook sequence 4, para 6.1).
- c. <u>Sampling and Analysis Plan</u> (1.2.3). Use the format in section 1 of the Handbook (sequence 4, para 6.1).
- d. <u>Health and Safety Plan</u> (para 1.2.4). Provide within six (6) weeks after the issuance of an order (sequence 4, para 6.1).
- e. <u>Community Relations Plan</u> (para 1.2.5). Provide within eight (8) weeks after issuance of an order (sequence 4, para 6.1).
- 1.4.2 Special Notification. Provide written notification of imminent health hazards and supporting documentation within three (3) days of telephone notification (sequence 16, para 6.1).
- 1.4.3 Presentation Materials. The contractor shall prepare and present up to two (2) presentation packages at meetings coordinated by the Air Force (sequence 9, para 6.1). Attendance of these meetings is included in paragraph 1.1.3 of this SOW. As part of the presentation materials, the contractor shall provide paper copies of all slides and overheads.
- 1.4.4 Meeting Summaries (para 1.1.3). Provide no later than five (5) days after conclusion of each meeting (sequence 18, para 6.1).
- 1.4.5 Newsletter. Prepare and submit a quarterly newsletter which presents the status of the entire base IRP Program. This will include preparing an outline resulting from input by all contractors involved in the program. The outline must be approved by the base and RTC prior to submittal of the newsletter. The final product will be printed and distributed as agreed to by the RTC. Assume a maximum of two (2) newsletters (Sequence no. 3).

- 1.3.10 Feasibility Study (FS). The contractor shall perform a FS concurrently with the RI. As much of the FS as possible shall be performed early in the RI/FS process and refined as additional RI data are obtained. The contractor shall use the information from the RI and the baseline risk assessment to develop and evaluate remedial action alternatives for each site where a threat to human health or the environment exists. The contractor shall follow the procedures specified in USEPA OSWER Directive 9355.3-01, "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA." The contractor shall employ streamlining methods wherever possible and develop and evaluate the minimum number of alternatives needed to provide a range of promising treatment and containment actions. The contractor shall eliminate impracticable alternatives from further consideration early in the FS process. The scope and level of detail shall be consistent with the nature and complexity of site problems.
- The contractor shall Develop and Screen Alternatives. 1.3.10.1 establish remedial action objectives and remediation goals for protecting human health and the environment. These objectives and goals shall be determined based on identified ARARs and acceptable exposure levels as defined in the baseline risk assessment and refined throughout the RI/FS process. Identify general response actions and applicable technologies based on site and contaminant conditions, and combine technologies to formulate distinct alternatives. The contractor shall develop alternatives which eliminate, control, and /or reduce risk to human health or the environment to acceptable levels for each pathway. Where a wide variety of promising alternatives exists, the contractor shall screen the alternatives based on effectiveness, implementability, and cost. The contractor shall detail the development and screening of the alternatives process and identify the alternatives selected for detailed analysis in the Informal Technical Information Report (ITIR).
- 1.3.10.2 Detailed Screening of Alternatives. The contractor shall conduct a detailed analysis on each alternative selected and identified in the above step and approved by the COR. Using the methodology in OSWER Directive 9355.3-01, the contractor shall evaluate each alternative against the nine criteria. In addition to the individual assessment, the contractor shall perform a comparative analysis to determine the relative performance of alternatives. The contractor shall focus the analysis on sub-factors and criteria most pertinent to each site and the scope and complexity of the proposed action. Provide a summary of the Detailed Analysis of Alternatives in the R&D report submitted following task completion. Include summary tables of the individual and comparative analyses that will be used in the Technical Report.
- 1.3.11 **Desicion** Documents. The contractor shall prepare and submit Decision Documents (DD) following the Handbook Section 4.4 as guidance. The purpose of the DD is to support a remedial action alternative or a no further action alternative.
- 1.3.12 **Site** Specific Requirements. The contractor shall perform the requirements listed in this SOW in conformance with the guidance of the Handbook, requirements of the approved WP, and the SAP. Annex A specifies the proposed values for field and laboratory activities to be conducted, specifications for field activities, information for sediment and soil samples, analytical methods, parameters for analysis, estimated number of analyses for water/sediment/soil samples, required analytical methods, estimated number of analyses for all core samples, estimated number soil gas analyses for each parameter, and field QC sample requirements for soil and water samples for costing purposes only.

- 1.4.6 Fact Sheets. As required by the base IRP Program, prepare and submit fact sheets which facilitate the public's understanding of the IRP Program. These sheets should include key community concerns regarding sites as specified by the base. Use the format agreed to by the base and RTC. Print and distribute the fact sheets as agreed to by the RTC. Assume a maximum of two (2) fact sheets (Sequence no. 3).
- 1.4.7 **Public Notices.** In accordance with paragraph 1.3.6.2, prepare and submit public notices for the Fairbanks and local newspapers. Use the format agreed to by the base and RTC (Sequence no. 3).
- 1.4.8 Photo Notebook. In accordance with paragraph 1.3.6.3, develop a photo notebbok which focuses on the overall base IRP Program. Prior to implementation, submit a conceptual layout of the notebook for review by the base and RTC (Sequence no. 9).
- 1.4.9 Mailing List. In accordance with the base Community Relations coordinator and paragraph 1.3.6.4, update the existing mailing list on a quarterly basis (Sequence no. 3).
- 1.4.10 Maps. In accordance with the base community Relations coordinator and paragraph 1.3.6.5, prepare presentation quality maps.
- 1.4.11 Information Repository/Administrative Records. Submit the Information Repository and Administrative Records in accordance with Air Force Guidance and in concurrance with the COR and the base Community Relations Coordinator. (sequence no. 4, para 6.1)
- 1.4.12 Data Management. The contractor shall meet the data deliverable requirements of the Installation Restoration Program Information Management System (IRPIMS). The contractor shall be responsible for recording field and laboratory data into a computerized format as required by the most current version of the IRPIMS Data Loading Handbook (mailed under separate cover). In order to perform this task, the contractor shall use the IRPIMS Quality Control Tool (QC Tool) and PC software utility (mailed under separate cover with software manual) to quality check ASCII data files and to check all data files for compliance with requirements in the IRPIMS Data Loading Handbook. Upon request, the IRPIMS Contractor Data Loading Tool (CDLT) is available. This PC software is designed to assist the contractor in preparing the various ASCII data files.

Individual IRPIMS data files (e.g., analytical results, groundwater level data, etc.), including resubmissions, shall be delivered with a transmittal letter by the contractor to the Air Force Center for Environmental Excellence (AFCEE) in sequence according to a controlled time schedule as identified in the current version of the IRPIMS Data Loading Handbook. The contractor shall include a copy of the Quality Control Tool error report, i.e., output from the QC tool, for each IRPIMS file submission. The error report shall be submitted both in hard copy and as an electronic file on the submission disks with the filename of the error report identified in the transmittal letter (SEOUENCE No. 3).

All contractor data deliverables shall be sent to:

AFCEE/ESD BLDG 624W
ENVIRONMENTAL RESTORATION DIVISION
ATTN: IRPIMS Data Management
Brooks AFB, TX 78235-5000

In addition, the contractor shall provide a copy of the transmittal letter to the Air Force contracting office responsible for the contract, HSC/PKV (Brooks AFB, TX, 78235-5000) for AFCEE contracts. This letter shall identify the files included or otherwise omitted (with an appropriate explanation), the Government contract and delivery order number, and the Air Force POC that is responsible for monitoring the Government contract.

The contractor shall be responsible for the accuracy and completeness of all data submitted. All data entered into the IRPIMS data files and submitted by the contractor shall correspond exactly with the data contained in the original laboratory reports and other documents associated with sampling and laboratory contractual tasks.

Each file delivered by the contractor will be electronically evaluated by AFCEE/ESD for format compliance and data integrity in order to verify acceptance. All files delivered by the contractor are required to be error-free and in compliance with the IRPIMS Data Loading Handbook. Any errors identified by AFCEE/ESD in the submission shall be corrected by the contractor.

- 1.4.13 Decision Document. The contractor shall prepare and submit DD as described in Section 1.3.11 (SEQUENCE No. 4, para 6.1).
- 1.4.14 Technical Reports. Summarize the findings of the tasks pursuant to the SOW, integrate them with the results of all pertinent previous studies, and formulate conclusions and recommendations for future efforts in Technical Reports.
- 1.4.14.1. Remedial Investigation (RI) Report (para 1.3.3). Provide a RI Report following the format in section 4 of the Handbook (sequence 4, para 6.1).
- 1.4.14.2. Risk Assessment (RA) Report (para 1.3.3.7). Provide a RA Report following the format in section 4 of the Handbook (sequence 4, para 6.1).
- 1.4.14.3 Feasibility Study Report (para 1.3.4). Provide a Feadsibility Study Report foillowing the format in section 4.0 of the Handbook. (sequence 4, para 6.1).
- 1.4.14.4 RI/FS Technical Report (para 1.3.3). Provide a RI/FS Technical Report following the format in section 4.0 of the Handbook. The RI/FS Technical Report shall integrate the RI, RA, and FS reports. Provide two microfiche copies with the final RI/FS Technical Report (sequence 4, para 6.1).
- 1.4.15 Basewide Comprehensive IRP Document. The contractor shall develop a comprehensive document that summarizes both the historic and projected IRP activities. This document shall be used as managment tool to efficiently guide future IRP activities at the DEW Line Sites and Cape Lisburne AFS. The contractor shall follow the outline developed by the AFCEE RTC. Assume two (2) updates (sequence no. 4)
- 1.4.16 Analytical Data ITIR. Prepare and submit the following ITIR's:
- a. <u>Development & Screening of Alternatives</u> (para. 1.3.10.1). Submit the results of the development and screening of alternatives in an ITIR prepared in compliance with section 3 of the Handbook (sequence 3, para 6.1)

- b. Detailed Screening of Alternatives (para 1.3.10.2).
- c. <u>DPM Scoring</u> (para 1.3.9.8). Provide scores, a summary of procedures and assumptions, and Automated DPM output tables for all sites scored with DPM (sequence 3, para 6.1).
- d. Mylar Map. Construct Radar Stations' maps of Mylar using guidelines in section 3 of the Handbook. The Maps shall contain all sites and related water and sediment sampling locations (sequence no.3, para. 6.1). The contractor shall create and update digitized map files. Use the digitized data file to produce the Mylar map. The contractor shall print the revision date on the Mylar maps and the date shall be encoded in the digitized data file. Provide a copy of the revised digitized data file to AFCEE-ESO/ER (sequence 1, para. 6.2).
- e. <u>Geophysical Survey Contour Map</u> (para 1.3.9.2). Provide a contour map showing geophysical survey results. Interpret the significance of the data in the R&D Status Report (sequence 3, para 6.1).
- f. <u>Soil Gas Map</u> (para 1.3.9.5). Provide site maps showing soil gas data superimposed on the sampling locations and incorporate soil gas data generated by the 11 CEOS/CEOR. Interpret the significance of the data in the R&D Status Report (sequence 3, para 6.1).
- g. <u>Site Characterization Summary Informal Technical Information Report</u> (<u>SCS ITIR</u>). The contractor shall prepare the report to include the following components:
 - 1. Source identification and contaminant delineation.
- 2. Identification and ranking of appropriate treatability studies for the listed sites.
- 3. Data and interpretations integrating the findings of the current study and all previous RI efforts at the sites.
- 4. Current isoconcentration plots of contaminants detected at each site, lithologic logs of each boring showing contaminants detected and relationship to other borings in the site, and cross-sections of the site showing contaminant distribution.
- 5. The contents and objectives of a Site Characterization Summary Informal Technical Information Report (ITIR) are specified in the Handbook. The Site Characterization Summary ITIR shall serve as a core document for the RI report. The contractor shall submit an annotated outline of each section of the ITIR for approval by the TPM prior to preparation of the report itself. The contractor shall prepare the report as specified in the accepted annotated outline. The contractor shall submit newly revised portions of the working draft ITIR in order to make available current site characterization data. A prime objective shall be to minimize the volume of comments on the working draft and final submittals by incorporating comments into the report in an on-going manner. The final summary shall contain all sites included in this effort (Sequence No. 4).
- h. Weekly Field Activities Report (para 1.3.13). Transmit a Weekly field activities report during field activities pursuant to a format developed by the AFCEE RTC. (Sequence 4, para 6.1)

II. Site Location and Dates

Dew Line Sites and Cape Lisburne, date to be established.

III. Base Support The base will:

- 3.1 Provide the contractor with existing engineering plans, drawings, diagrams, aerial photographs, digitized map files, etc., to facilitate evaluation of IRP sites under investigation.
- 3.2 Arrange for personnel identification badges, vehicles passes, and/or entry permits with the contention the contractor will provide necessary information to the base personnel no less than four weeks before needed.
- 3.3 Provide the contractor with all previously approved documents which provide information on all IRP efforts conducted at Dew Line Sites and Cape Lisburne and will aid in the determination of the amount of field work and analyses which need to be conducted.

IV. Government Furnished Property

See above in section III.

V. Government Points of Contact:

5.1 MAJCOM Coordinator

Major James R. Williams III AFCEE/ESRU 8001 Inner Circle DR STE 2 Brooks AFB TX 78235-5328 (210) 536-5243 DSN 240-5243 (210) 536-9026 FAX DSN 240-9026

5.2 Restoration Team Chief

Mr. Michael F. McGhee AFCEE/ESRU 8001 Inner Circle DR STE 2 Brooks AFB TX 78235-5328 (210) 536-5293 DSN 240-5293 (210) 536-9026 FAX DSN 240-9026

5.3 Base Point of Contact (POC)

Mr. Jim Wolfe 11 CEOS/CEVR 21885 Second Street Elmendorf AFB AK 99506-4420 (907) 552-4532 DSN 317-552-4532 (907) 552-1533 FAX DSN 317-552-1533

5.4 Public Affairs Coordinator

Ms. Wende Wolf 11 CEOS/DEVR 21885 Second Street Elmendorf AFB AK 99506-4420 (907) 552-4532 DSN 317-552-4532 (907) 552-1533 FAX DSN 317-552-1533

VI. Deliverables

6.1 Attachment 1 of the Basic Contract

Sequence numbers 1 and 5 listed in attachment 1 to the basic contract apply to all orders. Guidance for preparing R&D Status Reports (sequence 1) is contained in the Handbook, section 4. In addition, the sequence numbers and dates listed below are applicable to this order:

Sequence No.	Para No.	Block 10 (freq.)	Block 11 (as of date)	Block 12 (date of 1st. submit.)	Block 13 (date of final report)	Block 14 (no. of copies)
3 (NETWORK	1.1.4.1a	QTRLY	12APR93	30APR93	a	4
ANALYSIS) 4 (WORK PLAN) 4 (SAP) 4 (HSP) 4 (COMM. REL	I.1.4.1b I.1.1.4c I.1.4.1d I.1.1.4e	ONE/R ONE/R OTIME ONE/R	12APR93 12APR93 12APR93 12APR93	30MAY93 30MAY93 30MAY93 30MAY93	30JULY93 30JULY93 31DEC93	b b 10 b
PLAN) 16 (SPECIAL	1.1.4.2	ОТІМЕ	с	c	•	3
NOTIF.) 9 (PRESNT.	1.1.4.3	ASREQ	d	d	•	10
MATERIAL) 18 (MTG. RPTS) 3 (NEWSLETTER) 3 (PACT SHEETS) 3 (PUBLIC NOTICES) 9 (PHOTO NOTEBOOK) 3 (MAILING LIST) 3 (MAPS) 4 INFO REPOS 3 (IRPMS Data ITIR) (Data Management) BCHCON BCHLDI BCHSUL BCHSAMP BCHCALC BCHLTD BCHCALC BCHLTD BCHTEST BCHRES BCHGWD	[.1.4.4 [.1.4.5] [.1.4.6 [.1.4.7] [.1.4.8 [.1.4.9] [.1.4.10] [.1.4.11] [.1.4.12]	ONE/R OTRLY ASREO ASREO OTIME OTIME OTIME OTIME	12APR93 12APR93 12APR93 12APR93 12APR93 12APR93 31JUL93 31JUL93	30NOV93 15JUL93 15JUL93 15JUL93 15JUL93 15JUL93 31JAN94	3 g g	5 f h 1
4 DECISION DOC 4 RI REPORT 4 RISK ASSESSMENT 4 FEASIB. STUDY 4 RUFS REPORT 4 IRP DOCUMENT 3 SCREENING ALTE	I.1.4.14.3 I.1.4.14.4 I.14.15	ONE/R ONE/R ONE/R ONE/R ONE/R ONE/R OTIME	i 155EP93 10CT93 30SEP193 30SEP93 31JUL93 30SEP93	15FEB94 16MAY94 30AUG94 30SEP94 31OCT93 30DEC93	31OCT94 30APR94 15JUL94 1JAN95 10DEC93	b b b b
3 DETAL ANALYSIS	5 11.4.16.b	OTIME	28 FEB94	30MAR94	•	10
ALTER ITIR 1 DPM SCORING 3 MYLAR MAP 3 GEOPHYS CONT 3 SOIL GAS MAP 4 SCS ITIR 4 WEEKLY ACT RE	I.1.4.16c I.1.4.16d I.1.4.16.e I.1.4.16f I.1.4.16g P I.1.4.16h	OTIME OTIME OTIME OTIME ONER WEEKLY	30SEP93 k l l 15SEP93 13AUG93	j k 1 1 30NOV93 13AUG93	j - - 15FEB94	3 5 10 10 5

6.2 Reserved.

6.3 Notes

- a. Submit Quarterly Thereafter.
- b. One (1) first draft plan (8 copies), one (1) second draft plan (8 copies), and one (1) final plan (10 copies) are required. Incorporate Air Force comments into the second draft and final plan as specified by the RTC. Supply AFCEE/ESR with an advance copy of the first draft, second draft, and

final plan for acceptance prior to distribution. Distribute the remaining copies of each plan as specified by the RTC. The second and final reports shall be submitted within three (3) weeks of receipt of comments from the RTC.

- c. Primary and Secondary Documents. One first draft report (25 copies), one second draft report (25 copies), and one final report (35 bound copies plus the original camera-ready copy and a 3.5 inch disk formatted in WordPerfect 5.1 containing the document file) are required. Incorporate Air Force comments into the second draft and final reports as specified by the RTC. Supply the RTC with an advance copy of the first draft, second draft, and final reports for acceptance prior to distribution. Distribute the remaining copies as specified by the RTC.
- d. Provide written notice with supporting documentation within three (3) days of telephone notification and at the direction of the RTC. Assume a maximum of 100 pages.
 - e. Provide within one (1) week of task/meeting completion.
- f. Provide 500 copies of the Newsletters and distribute as agreed to by the RTC. This includes mailing the final product to on-base personnel and addresses on the existing mailing list.
- g. Provide draft and final deliverables. Provide two advance copies to the AFCEE RTC and to the 11 CEOS Community Relations Coordinator for acceptance prior to preparation of the final deliverables.
 - h. Provide poster-size map.
 - i. Submit with the second draft Technical Report
 - j. Submit with the Technical Report
 - k. Provide with the Technical Report
 - 1. Provide within four (4) weeks of task completion

ANNEX-A, TABLE A-1 SUMMARY OF ESTIMATED FIELD WORK FOR COST-ESTIMATING PURPOSES ONLY

Estimated Number of Monitor Wells to be Constructed Estimated Footage of Monitor Wells	5 100
Estimated Number of Water Samples for Lab Analysis	339
Estimated Number of Surface and Subsurface Soil Sampling Estimated Number of Soil Samples from Augerings	1350 1350
Estimated Number of Containerized Waste Samples	40
Estimated Number of Disposal Water Samples	5
Estimated Number of Sludge Samples	5
Estimated Number of Wipe Samples	3
Estimated Number of Geophysical Surveys Estimated Total Number of Survey Days	3 20
Estimated Number of Soil Gas Survey Days	20

Annex-A, Table A-2 Analytical METHODS AND ESTIMATED TOTAL NUMBER OF SOIL ANALYSES (for Cost Estimating Purposes Only)

Marcalous Marc		analytical mathed (a) kepotting	kepot t ting Untes	Nun.Liet of	Ti 1p Blanks	And Cond Blanks	Equipment Dup/Rep Blanks	Dup/Rep	Second Column(b)	Total Analyses
SHJ050/J3H0U1> (Inc.d.) Ing./Kij 400 2.0 2.0 4.0				one it and						ļ
Call SMJUSD (SMMOLD) (ImACA) may/Ka) 400 20 400 100<	Petroleum Hydrocarbon (Gasoline Range Organics)	(Loal) 4108W2/050KW2	ng/Eg	00+	3	3	0.7	07		500
Call SMJ050/JW80119 IMCAT Mag/Kg 100 - 6 10 - SWJ050/JW80110 mg/Kg -			eme / K.s	400			0.7	0+	•	9 +
SMJ050/SW6010 mg/Kg 100 6 10 SWJ050/SW7421 mg/Kg - - - - SWJ050/SW7421 mg/Kg - - - - SWJ050/SW7740 mg/Kg - - - - SWJ050/SW7740 mg/Kg -<	Petroleum Hydrocarbon (Diesel Range Organics)	SW3050/SW8013 (RICH	No /No							
SW1471 mg/Kg	ICP Screen (23 Metals, exclude Boron and Silica)	SW3050/SW6010	mg/Kg	100	•		y)	10	•	116
SHJ050/SH/121 SHJ050		SW305ú, amīúāū	mg/Kg	1				•	\$	0
SW1711 mg/K3	Arsen I C	SW3050/SW7421	mg/Kg	1	1	•		•	ı	0
### SM1050/5w/740 ### BAND540/5w/8080 ### BAND540 ### BAND550 ### BAND540 ### BAND54	pear	17.47.N	mg/Kg	•	٠		ı	ı	•	0
es and PCBs SM3540/SW6080 mg/Kg 500 - 20 50 250 nds SM3540/SW4210 mg/Kg 72 8 4 7 36 250 quounds SW3540/SW4210 mg/Kg 100 7 10 10 7 36 drocarbons SW3500/SW4210 mg/Kg - 1 1 1 1 36 nds SW3500/SW4220 mg/Kg - 1 <t< td=""><td>Mercury</td><td>SW3050/SW7740</td><td>mg/Kg</td><td>ı</td><td>•</td><td></td><td>•</td><td>ı</td><td></td><td>0</td></t<>	Mercury	SW3050/SW7740	mg/Kg	ı	•		•	ı		0
SH9210 Mg/Kg 120 1	Selenium	SW3540/SW8080	mg/Kg	200	1		20	20	250	820
The second state The second	Organochlorine Pesticides and Pubs	SW8240	6X/6m	72	20	æ	7	١	36	135
Proceedings	Volatile Organic Compounds									
SH540/SH8310 mg/Kg	Semivolatile Organic Compounds	SW3540/SW8270	mg/Kg	100			10	10	1	120
nds SW5030/SW8020 mg/kg - - 4 8 nds SW5030/SW8260 mg/kg - - 4 8 nds SW5030/SW9260 mg/kg - - 4 8 ching Procedures (TCLP) SW3010 mg/kg - - 4 8 ching Procedures (TCLP) SW3311 mg/kg - - - 4 8 sching Procedures (TCLP) SW3311 mg/kg -	Polynuclear Aromatic Hydrocarbons	SW3540/SW8310	mg/Kg	1	ı		i	ı	1	، د
nds SW5010/SW8020 mg/kg -	Volatile Organic Compounds	SW503075W8030	mg/kg	,	•			•	•	9
SW5030/SWb260 mg/kg s s s s s s s s s	Wolarile Ordanic Compounds	SW5030/SW8020	mg/kg	•	ŧ		,	,	•	0
ASTM Dizli6 Swj3640 Cleanup Swj3640 mg/Kg 4 8 swj1311 mg/L 40 4 8 Fercent (1) 650 4 8 Fercent (1) 650 4 8 Swj3640 S		SW5030/SW8260	mg/kg	•	,		•	ı	1 ;	0
SW9010 mg/Kg	Volatile Organic Compounds		04/6m	d			ı	4	00	100
SW1311 mg/L 40	Total Organic Compounds	DODEMS / DEDEMS	7	0	•				•	· c
SW1311 mg/L 40	Cyanide, Total			ř	•		r	:		, ,
Percent ASTM D.2.16 (1) 650	Toxic Characteristic Leaching Procedures (TCLP)	SW1311	mg/L	40	1	ı	ı .	ı	ı	7
/Florisil Cleanup SW3660/SW3620	Soil Moisture Content	ASTM D2216	Percent (%)	9	•		•	1	ı	059
/Florisil Cleanup Sw3660/Sw3640	Soll PH	SW9045		059	ı		1	•		059
Cleanup 5W3640	Sulfer Cleanup/Florisil Cleanup	SW3660/SW3620		•	1	•	1	•	1	0
3000 28 28 80 161 294	Col-Permeation Cleanup	SW3640		1	•	ı		•	ı	•
	Total Analyses			3000	28	28	80	161	294	3591

F33615-90-D-4010-002202 tachment 1 Page 20 of 21

Analyt	Annax A. TABLE A.3 Analytical Methods and Settlamted Yests Number of Water Analyses Analytical Methods and Settlanting Purposes Only)	mated Total	.3 Mumber of W oses Only)	ster Anal;	•				
	amplytical method (a)	Reporting Units	Number of Analyses	Trip Blents	Amb Cond Blanks	Equipment Dup/Rep Blanks	Dup/Rep	Second Column(b)	Totel Anelyses
kajinity-Carbonate, Bicarbonate, 6	A403	1/bu	ā				-	•	. =
dronide (fleld test)			•						=
pecific Conductance (field test)	E120.1	ng/L	o -						1.7
H (field test)	E150.1	mo/sor/um	15				~	ı	
esidue, Filterable (Total Dissoloved Solids)	E160.1	1/6u	080			•	æ		.
on-Filterable Residue (Total Suspended Solids)	£160.2	1/6m	0.8			•	co		
(les) (jes)	E176.1	dey C	200				1	•	200
emperature (cristal processor and suffere)	E325.1	mg/L	•	*		•	•		0
	E353.2	ոց/և				•		•	0
ittogen, militarenning.	SW30U5/5W6010	ng/L	100		•	r	52	•	132
	090LMS	1/6s			•	1	1	•	0
irsenic	SW1005/SW/421	ng/L	100			~	01		112
Dee:	SW7470	mg/L			•	•	•		0
lercury	SW7740	mg/L			•		•	•	•
Selenium Selenium Selenium Selenium	SW5030/SW8015 (mod.)	1/6u (150	10	01	sc.	35	•	210
Ject Roleum nythologian (1985)			-			'n	35	٠	190
etroleum Hydrocarbons (Diesel Range Organics)	SWSQ307SW8Q15 (mod.)		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	20	30	-	52	1.5	270
Purgeable Helocarbons	o toans /orogen	2		3	30	4	25	125	320
tonhalogenated Volatile Organics	\$108M\$/010\$M\$	1/6d	2		, d	•	52	125	320
Purgeable Aromatics	SW5030/SW8020	μg/L	150	æ	•	• •	;	č	269
Organochlorine Pesticides and PCBs	SW3510/SW8080	hg/L	166		1	•	: :	3	64
Semivolatila Organic Compounds	SW3510/SW8270	1/6d	150		•	~	<u> </u>		
Polynucles: Arometic Hydrocarbons	SW3510/SW8310	hg/L	150		•	•	15	•	69 6
Volatile Organic Compounds	SW1510/SW8260	1/6H	•		•	•	•	1	> ;
Volatile Organic Compounds	SW)510/SW8240	µ9/L	150	3 0	55	•	52	125	320
Total Organic Compounds	0906MS	1/6d	0.80			₹	10		5
for a percoleum Hydrocarbon (MTPH-HCID)	E418.1	mg/L			•	•		1	0
and a Committee of the property of the propert	SW366U/SW3620	•	•	•		•	•	•	G
	SW3640	•	•			•	•	•	0
Gel-Permeation Cleanup			2041	7	\$	53	282	533	2993
COLUMN TOTALS									

Notes:

b

a Unless an abbreviated list of analytes is specified under "Parameter" above, the analytical protocol shall include all analytes listed in the referenced analytical method. The methods cited are from the following sources:

"A" Methods Standard Methods for the Examination of Water and Wastewater, 16th Edition (1985)

E Methods Methods for Chemical Analysis of Water and Wastes, EPA Manual, 600/4-79-020 (USEPA, 1983--with additions)

SW Methods Test Methods for Evaluating Solid Waste,
Physical/Chemical Methods, SW-846, 3rd Edition (USEPA,
1986)

"ASTM" Methods American Society for Testing and Materials, 1919 Race treet, Philadelphia, PA 19103

The maximum number of second-column confirmation analyses shall not exceed fifty (50) percent of the actual number of field samples (to include duplicates, replicates, ambient, condition blanks, trip blanks, and equipment blanks). If the number of samples requiring second-column confirmation exceeds this allowance, contact the HSD Technical Project Manager. The total number of samples listed in Tables A-4 and A-5 includes the allowance applicable to each GC method. IF GC/MS, or a combination of second-column GC and GC/MS, is used, the total cost of all such analyses for a particular parameter shall not exceed the funding allowed for positive confirmation using only second-column GC.

DEW LINES SOW/MOD I

REF 68X

68 X					68 X
AMENDMENT C	F SOLICITATION/MODIF			1. PAGE 1	OF 2
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F33615-90-D-4010-002203 Page 2 of 2

1. Pursuant to the "Changes" Clause of Section I of the basic contract. The performance period and the final delivery schedule are changed from 15 Feb 94 (performance period) and 1 Jan 95 (final delivery schedule date) to 31 Dec 94. The ceiling amount of this delivery order will not be affected by this modification. This modification was generated by request of the contractor with no increase to the ceiling amount, contractor's letter dated 10 Feb 94 is incorporated to this document by reference.

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- 1. Pursuant to the "Changes" Clause in Section I of the basic contract, the Statement of Work for Delivery Order 0022, dated 06 Jul 93 is superseded by the revised Statement of Work, dated 17 Jul 94. The subject delivery order ceiling amount is increased by \$229,526.00.
- 2. As a result of paragraph 1 above, the said order is more specifically modified as set forth below:
- a. <u>SECTION A Cover Page</u> The Not-to-Exceed amount in block 20 (cover page) is increased BY \$229,526.00 from \$3,299,352.00 to \$3,528,878.00."

b. SECTION B - THE SCHEDULE

Item No	Supplies/Ser	vices 	Quantity Purch Unit	Unit Price Total Item Amount
0001	CLIN Change	sec class: U	1 LO	N N
	noun: SAMPLING, ANAL acrn: XA nsn: N site codes: pqa: pr/mipr data: FY7624 FY7624 type contract: Y	D acp: D fob: D		

type contract: Y

descriptive data:
Conduct work in accordance with the Statement
of Work (SOW) of this order, dated 17 JUL 94 and
Section C, The Description/Specifications of the
Basic contract. Submit data in accordance with
Attachment #1, the Contract Data Requirements List (CDRL)
of the basic contract as implemented by paragraph VI

of this order's SOW. This modification adds \$83,590.00 to the price for CLIN 0001.

0002 CLIN Change sec class: U 1 N LO N

noun: SAMPLING, ANALYSIS AND DATA

acrn: XA nsn: N

site codes: pga: D acp: D fob: D

pr/mipr data: FY7624-94-08202, FY7624-93-08305, FY7624-94-08353,

FY7624-94-08235, and FY7624-94-08663

type contract: Y

descriptive data:

Provide support in accordance with the Statement Work (SOW) of this order, dated 17 JUL 94 and Section C, The Description/Specification of the basic contract. This modification adds \$128,148.00 to the price for CLIN 0002.

SECTION B - THE SCHEDULE (Cont'd)

Item No	Supplies/Ser		Quantity Purch Unit	Unit Price Total Item Amount
0004	CLIN Change	sec class: U	l LO	N N

noun: CHEMICAL ANALYSES

acrn: XA nsn: N

site codes: pqa: D acp: D fob: D

pr/mipr data: FY7624-94-08353, FY7624-94-08235, and

FY7624-94-08663

type contract: Y

descriptive data:

This modification adds \$17,788.00 to the price

for CLIN 0004.

c. <u>SECTION C - Description/Specs</u> - The SOW for this order entitled "Installation Restoration Program Remedial Investigation/Feasibility Study, Distant Early Warning (DEW) Line Sites and Cape Lisburne AFS, AK", dated 17 Jul 94 is attached hereto as Attachment #1 to this modification.

d. $\underline{\sf SECTION}\ {\sf F}\ -\ {\sf Supplies}\ {\sf Schedule}\ {\sf Data}\ -\ {\sf The}\ {\sf delivery}\ {\sf schedule}\ {\sf is}\ {\sf modified}$ as set forth below:

Item No	Supplies Schedule Data		Delivery Quantity	Schedule Date
0001	CLIN Del Sch Change acrn: XA ship to: U	s ec class: U	1	95APRO1
0002	CLIN Del Sch Change acrn: XA ship to: U	sec class: U	1	9 5APR 01
0004	CLIN Del Sch Establish acrn: XA ship to: U	sec class: U	1	9 5APR 01

e. <u>SECTION G - Accounting Classification Data</u>:

ACRN Acct Class data Supplemental Accounting Classification Amount

AC ACCOUNT ESTABLISH

UNCLASSIFIED

5743400

F74400 \$229,526.00+

304 7431 434419 040000 53440 000000 674400

pr/mipr data: FY7624-94-08663

XA SPECIAL ACRN CHANGE UNCLASSIFIED

descriptive data: Special ACRN XA funds CLINs 0001, 0002, and 0004 and includes the following:

AA:\$ 299,855.00

AB:\$ 99.986.00 (mod 0022.01)

:\$2,899,511.00 (mod 0022,02)

AC:\$ 229.526.00 (mod 0022-04)

TOTAL \$3,528,878.00

FINANCE OFFICER: Pay funds in alphabetical order.

3. All other terms and conditions remain unchanged.

1994 JUL 17-1993 JUL 6

STATEMENT OF WORK

INSTALLATION RESTORATION PROGRAM REMEDIAL INVESTIGATION/FEASIBILITY STUDY

STAGE 1

DISTANT EARLY WARNING (DEW) LINE SITES and CAPE LISBURNE AFS, AK

I. DESCRIPTION OF WORK

1.1 Scope

1.1.1 Background. The objective of the Air Force Installation Restoration Program (IRP) is to assess past hazardous waste disposal and spill sites on Air Force installations and develop remedial actions consistent with the National Contingency Plan (NCP) for those sites which pose a threat to human health and welfare or the environment. This objective is achieved through a Remedial Investigation Feasibility Study (RI/FS) process in which conclusions and recommendations drawn from accurate and validated data are used to structure and guide subsequent activities.

The RI/FS process includes scoping to define data requirements and objectives, a remedial investigation to characterize sites for a baseline risk assessment, and a feasibility study to define and evaluate alternative remedial actions so that a recommended action may be selected. Each of these steps of the RI/FS process can be conducted in stages that focus on particular aspects of the process.

The Contractor shall accomplish the actions described in this Statement of Work (SOW) to complete the RI/FS process at the following seven Dew Line Sites and Cape Lisburne:

Barter Island AFS (BAR-M); Bullen Point AFS (POW-3); Point Lonely AFS (POW-1); Point Barrow AFS (POW-M); Point Lay AFS (LIZ-2); Wainwright AFS (LIZ-3); and Oliktok Point AFS (POW-2).

Requirements for Project Activities. The-Installation Restoration Program (IRP) Handbook referenced in this Statement of Work provides requirements for laboratory and field activities and applicable formats for project documents that shall be used by the Contractor. Volume 1 of the Handbook dated May 1992 is provided under separate cover. This document is referenced in this Statement of Work as the Handbook. The Handbook to Support the Installation Restoration Program (IRP) Statements of Work, dated September 1993, referred to in this SOW as "The Handbook," is provided under separate cover as general guidance only. Any reference within the Handbook language regarding compliance and/or formats for reports as a requirement of this Delivery Order shall be considered deleted. If a conflict is identified between this general guidance and any OSWER, U.S. Environmental Protection Agency (EPA), or other regulatory guidance or requirements, the Handbook shall be disregarded. Also, references to requirements for approval for deviations throughout the Handbook shall be considered invalid. Finally, the Method Detection Limits (MDLs) identified in the Handbook are a consolidation of numerous CFR documents which incorporate current EPA requirements. However, the Contractor shall be responsible for any updates in the CFR. The Contractor is responsible for the thorough knowledge and understanding of the previous findings and recommendations that affect this

task prior to the start of field activities. The documents involved include but are not limited to the IRP Phase I Records Search, and the IRP Phase II plans and reports addressing the Dew Line Sites and Cape Lisburne.

- 1.1.3 Meetings. A maximum of two (2) Contractor personnel, including the project leader, shall attend eight (8) meetings at Elmendorf AFB, AK. Each meeting shall be two (2) 8 hour workdays in duration. All meetings shall be coordinated by the Restoration Team Chief (RTC).
- 1.1.4 Special Notifications. The Contractor shall immediately report to the RTC via telephone, any data or results generated during this investigation which may indicate an imminent health risk. Following this telephone notification, a written notice shall be prepared and delivered within three (3) days. This notification shall include supporting documentation (sequence 16, para 6.1)

1.2 Project Scoping Documents

The purpose of the project scoping documents is to clearly and comprehensively define project activities prior to the initiation of field work. The Contractor shall prepare and submit the following project scoping documents for this task prior to the initiation of any field activities, removal actions, or laboratory analyses.

- 1.2.1 Engineering Network Analysis. Provide within ten (10) days after the issuance of an order a computer generated network analysis which is a detailed task plan for the RI/FS work efforts. The network analysis (GANTT) chart shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of work scheduled for completion by any given date during the period of the delivery order. The network analysis (GANTT) shall show both serial and parallel subtasks leading to a deliverable product or report, and shall show early and late start and completion dates with float. The network analysis (GANTT) shall be updated and submitted quarterly (sequence 3, para 6.1).
- 1.2.2 Work Plan. This section will discuss the overall approach, (including a brief summary of the Conceptual Site Model and Data Quality Objectives), major tasks, scope, timeline, and major decision points. Due to the extreme remoteness of the Dew Line Sites and Cape Lisburne, the Contractor shall include a detailed plan for logistics and strategy to complete the RI/FS field activities. Follow the format specified in section 1 of the Handbook. In preparing the Work Plan, use previous reports and the information gathered during the literature search and presurvey along with experience at similar sites. Reevaluate the recommendations for Dew Line Sites and Cape Lisburne developed during previous IRP stages. The Contractor shall also prepare a draft and final addendum to the existing DEW Lines RI/FS work plan. The addendum shall detail the removal activities occurring at Cape Lisburne LRRS pursuant to paragraph I.1.3.14 of this SOW. (sequence 4, para 6.1).
- 1.2.3 Sampling and Analysis Plan (SAP). The SAP consists of a quality assurance plan (QAPP) and a Field Sampling Plan (FSP). Prepare a SAP describing how project activities will be accomplished in the format specified in section 1 of the Handbook. The Contractor shall also prepare a short addendum to this basic SAP which focuses on those sampling and analysis activities undertaken as part of the removal action specified in paragraph I.1.3.14 of this SOW. Incorporate review comments and obtain RTC concurrence prior to the start of field activities (sequence 4, para 6.1).

- 1.2.4 Health and Safety Plan (HSP). Provide a written Health and Safety Plan within eight (8) weeks after the issuance of an order. The Contractor shall also prepare an addendum to the existing DEW Lines RI/FS HSP. concerning removal activities conducted pursuant to paragraph I.1.3.14 of this SOW. The Contractor shall comply with USAF, OSHA, EPA, state, and local health and safety regulations regarding the proposed work effort. Use EPA guidelines for designating the appropriate levels of protection needed at the study sites. The Health and Safety Plan shall provide no less protection than the protection contained in the manual entitled "Health and Safety Requirements for Employees Engaged in Field Activities dated 1981 and the "Occupational Safety and Health Manual for Hazardous Waste Sites Activities" dated 1985 and 29 CFR 1910. Coordinate the Health and Safety Plan directly with applicable regulatory agencies prior to submittal to AFCEE/ESR. The Contractor shall certify to AFCEE/ESR that the Contractor has reviewed the coordinated Health and Safety Plan with each employee and also subcontractor's employees prior to the time each employee engages in field activities (sequence 4, para 6.1).
- Community Relations Plan. The Contractor shall prepare a 1.2.5 Community Relations Plan (CRP) for the DEW Line Sites and Cape Lisburne AFS outlining the specific public communications and involvement techniques to be used in coordination with remedial site activities (sequence 4, para 6.1). Follow the guidance contained in "Community Relations in Superfund, a Handbook*, office of Solid Waste and Emergency Response (OSWER) Directive 9230.0-03C (EPA/540/R-92/009, January 1992, PB92-963341), and other applicable directives. Also, use as a guidance previously accomplished CRP from other installations in Alaska. Appropriately adapt such guidance to the local situation at the DEW Line Sites and Cape Lisburne. As described in OSWER Directive 9230.0-03C, the CRP shall include, but not be limited to, a description of the sites and the community, an overview of the community involvement to date, key community concerns regarding the site and AF site activities, and suggested community relations activities. A contact list of elected officials, agency representatives, and interested groups and individuals shall be included in appropriate copies of the plan. In addition, the plan will include suggested locations for meetings and information repositories. Contractor activities to develop the CRP shall include conducting a review of site information provided by the AF.

1.3 Project Activities

The Contractor shall conduct the following tasks to achieve the purposes stated herein, in compliance with approved scoping documents, the Handbook, and all applicable regulations and requirements.

- 1.3.1 Community Relations. Provide support to the base public affairs office for the tasks described below pertaining to the RI/FS Community Relations Program.
- 1.3.1.1 <u>Public meetings and workshops</u>. The Contractor shall be responsible for coordinating public meetings and workshops for all DEW Line Sites and Cape Lisburne AFS. This includes producing briefing scripts, slides and any associated products such as response cards and sign-in sheets. As requested by the base Community Relations office in coordination with the RTC, research and provide materials for public queries, news media queries, and news releases. Assume a maximum of one (1) workshop/meeting (Seq. nos. 3,9).

- 1.3.1.2 <u>Public notices.</u> As required by the base Community Relations office and the RTC, the Contractor shall prepare and publish public notices for the Fairbanks and local newspapers. The purpose of these notices is to inform the public of a meeting, workshop, or comment period in which they have the opportunity to be involved in the IRP Program at DEW Line Sites and Cape Lisburne AFS. Also, these notices may be utilized to inform the public of other pertinent program information such as quarterly notices of documents placed in the information repositories. The format for the notices shall be coordinated with the Community Relations office and RTC, and then submitted to the RTC for review prior to delivery to the base. Assume a maximum of two (2) notices (Seq. no. 3).
- 1.3.1.3 <u>Photo Notebook.</u> The Contractor shall develop a photo notebook which focuses on the overall IRP program at DEW Line Sites and Cape Lisburne AFS. The layout of the notebook will be coordinated with the public affairs office and RTC. Assume a maximum of one (1) update (Seq. no. 9).
- 1.3.1.4 <u>Mailing List.</u> In coordination with the base Community Relations office and the RTC, prepare and update the mailing list on a quarterly basis. Assume a maximum of two (2) updates (Seq. no. 3).
- 1.3.1.5 <u>Maps.</u> Prepare presentation quality maps of the installations and their sites to use in newsletters and to distribute to the public.
- 1.3.1.6 <u>Information Repository/Administrative Record</u>. Prepare a listing of all documents required for the Information Repository and Administrative Record. Create an Information Repository and Administrative Record. The Repository and Record will be maintained by the 11 CEOS/CEVR Community Relations Coordinator. Assume two locations for the Repository and Record, one in Anchorage and another in Elmendorf AFB, AK. Actual locations will be determined by the 11 CEOS/CEVR Community Relations Coordinator.
- 1.3.2 Literature Search. Conduct a literature search and analyze aerial photos of the DEW Line Sties to supplement existing information that has been collected. The purpose of the literature search is to complete the conceptual site model so that a numerical estimate of risk can be developed.
- 1.3.3 Presurvey. Within eight weeks of the issuance of an order, the Contractor shall visit the Dew Line Sites and Cape Lisburne to ensure complete understanding of site conditions. Coordinate this visit with the RTC and the 11 CEOS project manager. The Contractor shall look for evidence of contamination at each site visited (e.g., leaking drums, vegetative stress, leachate seeps). The Contractor shall observe the physical settings of each site visited to formulate specific recommendations concerning boring placement, use of geophysical techniques, and other aspects of the proposed field investigation. The findings of the presurvey shall be used to prepare the Work Plan, SAP, and HSP for the RI and to prepare scoping documents for the treatability study(ies). Assume one presurvey and one reconnaissance trip.
- 1.3.4 Quality Assurance/Quality Control (QA/QC). A QA/QC program shall be conducted and documented for all work pursuant to this delivery order. Contractor and project-specific documents concerning QA/QC procedures and requirements shall be strictly followed. Data generated under the QA/QC program shall be used by the Contractor for evaluating the analytical results and field records assembled for each site to identify accurate and validated data that may be used to assess risk, develop conceptual site models and evaluate alternatives.

- 1.3.5 Conceptual Site Model. Use all available RI/FS data supported by acceptable QA/QC results (as measured against QAPP requirements) and site characterization information to refine, based on newly collected data, the conceptual site model. The model shall define the nature and extent of contamination and the transport and fate of those contaminants. The minimum requirements of the model are given in section 2 of the Handbook. The complexity and detail of the site model shall be consistent with the nature of the site and site problems, and the amount of data available the conceptual site model shall be documented in the Work Plan.
- 1.3.6 ARARS Evaluation. The Contractor shall identify all Applicable or Relevant and Appropriate Requirements (ARAR). These ARARS will be documented in the Work Plan.
- 1.3.7 Data Collection, Sampling, and Analysis Procedures. The Contractor shall conduct field activities, sampling, laboratory analysis, and data quality assessment. Section 2 of the Handbook is recommended for the Contractor to follow. The Contractor shall conduct all activities in accordance with the WP and the SAP approved by the COR. The COR shall be notified in writing of any planned deviation from the activities specified in these documents. COR approval of deviations is required prior to performance. The Contractor shall ensure that all analyses and analytical methods' CA/OC requirements are being met at all times before and during the analysis of samples.

The field investigation (including all drilling and sampling operations) shall be supervised by a registered geologist, hydrogeologist, or professional engineer. If required by the state, the on-site field supervisor shall be certified by the state to install test wells. A detailed log of field conditions, materials penetrated during drilling, well completion, and sampling conditions, as described in Section 2 of the Handbook, shall be maintained and made available for Government inspection upon request. Decisions on well and boring locations, well depths, screened intervals, and all details of the field investigation shall be made by the COR, and the Contractor's field or project supervisor.

1.3.8 Regulatory Requirements and Permits. All well drilling, development, sampling, laboratory analysis, and other activities pursuant to this effort shall be conducted in strict accordance with all applicable federal and state laws, ordinances, rules and regulations, and all authorities with jurisdiction over such activities. The Contractor shall complete permits, applications, other documents, and proficiency tests required by the regulatory agencies. The Contractor shall file documents with appropriate agencies and pay all applicable permit and filing fees. The Contractor shall identify locations requiring permits to Radar Station Manager. The Contractor shall include all correspondence in appendices to the technical reports in accordance with Section 4 of the Handbook.

All laboratory analyses shall conform to all applicable federal, state, and local regulatory agency requirements. If the requirements specify that certification is necessary to conduct one or more specific analyses, the Contractor shall furnish documentation showing laboratory certification with the first set of analytical data supplied to AFCEE/ESR and the COR.

The Contractor shall containerize and sample materials suspected to be hazardous in accordance with applicable requirements. Guidance from the Handbook, and the approved Plans. The Contractor shall transport these containerized materials to a location within the installation boundary designated by the Radar Station Manager at a frequency specified by the

Station Manager. The Contractor shall handle, store, and/or dispose of potentially hazardous materials. The Contractor shall transport and empty containerized materials determined not to be hazardous to locations within the installation boundary identified by the Station Manager.

- The Contractor shall conduct a Remedial Investigation (RI). 1.3.9 RI to characterize environmental conditions; define the concentration, nature, and extent of contamination; and quantitatively estimate the risk to human health and the environment and study the area through the collection of geologic and hydrologic data, environmental samples, the laboratory analyses of those samples for potential contaminants, the evaluation of the analytical results and field measurements with respect to quality control data, and the interpretation and analysis of accurate and precise data. The purpose of data collection, sample collection, and laboratory analysis is to determine whether any contaminants generated from installation activities have entered the environment. The field investigation is used to determine the source of any identified contaminants, the magnitude of contamination relative to Applicable or Relevant and Appropriate Requirements (ARARs), and any naturally occurring or background concentrations for specific compounds. The RI shall comply with the specifications, procedures, and methodologies presented in the projectspecific SAP. The COR must be notified in writing prior to any modification of or deviation from any activity described in these documents.
- 1.3.9.1 Soil Borehole Drilling and Sampling and Well Installation and Sampling. The Contractor shall drill and collect samples from boreholes as specified in the SAP. The Contractor shall evaluate the need to install, sample, and develop monitoring or extraction wells.
- 1.3.9.1.1 Lithologic Samples. The Contractor shall describe core samples at least every five (5) feet of drilling or at each change in lithology, whichever is less, to indicate significant changes in lithology of characteristic properties that relate to the strata penetrated. Any deviations shall be coordinated with the COR. Guidance for standard identification practices are found in the Handbook. The Contractor shall include in the field logbook observations made by the driller and rig geologist during drilling such as depth to water, penetration rate, drill rig behavior, and other observations that might be indicative of changes in formation characteristics. The Contractor shall record depth to permafrost in all the soil borings and shall not proceed beyond five (5) feet into the permafrost layer.
- 1.3.9.1.2 Drill Cuttings and Drilling Fluids. The Contractor shall containerize all drill cuttings and drilling fluids. All drill cuttings and drilling fluids shall be managed and disposed of in accordance with the project SAP. (Note: The Contractor shall be responsible for providing all necessary containers.) The Contractor shall be responsible for the logistics of the ultimate disposal of all drill fluids or drill cuttings deemed hazardous in accordance with current EPA off-site disposal policy and state and/or local hazardous waste disposal laws. The contractor shall coordinate with the Station Manager for on-site placement and disposal of all drill cuttings, fluids, purge fluid, and excavated material. If on-site disposal is excluded, all hazardous waste shall be transported by a permitted hazardous waste transporter to a licensed Resource Conservation and Recovery Act (RCRA) approved facility and be accompanied by a Uniform Hazardous Waste Manifest. The Contractor shall provide a final, completed copy of the hazardous waste manifest to the 11 CEOS/CEVR. The Radar Stations' hazardous waste managers will sign all hazardous waste manifest documents.

- 1.3.9.1.3 Well/Boring Precautions. The Contractor shall mark the field locations of all borings during the planning/mobilization phase of the field investigation. The Contractor shall consult with base personnel to minimize the disruption of base activities, to properly position wells with respect to site locations, and to avoid penetrating underground utilities. The Contractor shall obtain all permits prior to commencement of digging and drilling operations. The Contractor shall utilize a registered land surveyor in determining the elevations and locations of all off-base background study borings. All borings and wells from which samples are taken shall be surveyed by the Contractor for vertical and horizontal control. The Contractor shall record the positions on project and site specific maps. Bench marks used must have been previously established from and be traceable to a U. S. Coast and Geodetic Survey (USCGS) or U. S. Geological Survey (USCGS) survey marker. Clearly identify all bench mark locations on the base map.
- 1.3.9.1.4 Water-Level Measurements in Boreholes. The Contractor shall measure water levels in all boreholes after the water level has stabilized. Include this information and the date of measurement in the boring logs. Also, record soil moisture conditions (moist, wet, saturated, etc.) in the boring log.
- 1.3.9.1.5 Air Monitoring During Drilling. The Contractor shall monitor the ambient air in the breathing zone above the borehole during all drilling with an appropriate organic vapor analyzer to identify potentially hazardous and/or toxic vapors. Include air monitoring results in borehole logs.
- 1.3.9.1.6 Subsurface Soil Sampling. The Contractor shall collect soil samples from borings as specified in the SAP. The SAP specifies the analytical methods, the parameters for analysis, and the estimated number of analyses for soil samples.
- 1.3.9.1.7 Well Construction Requirements. The Contractor shall coordinate with the COR to determine well completion requirements (flush or projected above ground surface). All wells shall be secured as soon as possible after drilling. The Contractor shall provide corrosion resistant locks for both flush and above-ground well assemblies. The locks shall be compatible with existing wells. The Contractor shall turn the lock keys over to 11 CEOS/CEVR POC following completion of the field effort. The Contractor shall coordinate with the 11 CEOS/CEVR POC, the RTC, and the COR the selection of exact well and screen placement, gravel pack design, and screen slot size.
- 1.3.9.1.8 **Well Logs.** For each well, the Contractor shall prepare a well completion log and schematic diagram showing well construction details. Lithologic descriptions, well elevation survey data, and other information included in the well logs shall conform to the specifications of the SAP.
- 1.3.9.1.9 Well Development. The contractor shall develop each well as soon as possible. Guidance for well development procedures are found in the Handbook. The Contractor shall measure the rate of water production, pH, specific conductance, and water temperature during well development.
- 1.3.9.1.10 Well Placement. The Contractor shall avoid installing wells in depressions or areas subject to frequent flooding and/or standing water. If wells must be installed in such areas, the Contractor shall design the wells so standing water does not leak into the top of the casing or cascade down the annular space.

- 1.3.9.1.11 Well and Borehole Clean-up. The Contractor shall clean the area following the completion of each well and borehole. The Contractor shall return all sites to the original condition of the site.
- 1.3.9.1.12 Groundwater and Surface Water Sampling. The Contractor shall collect groundwater and Surface Water samples from newly developed well and existing wells and from surface water bodies. The SAP shall specify the analytical methods, the parameters for analysis, and the estimated number of analyses for groundwater and surface water samples.
- 1.3.9.1.13 Composite Sampling. The Contractor shall collect and analyze drill cuttings, fluids, purge fluids, and excavated material. The SAP shall specify the analytical methods, the parameters for analysis, and the estimated number of analyses for composite samples.
- 1.3.9.2 Geophysical Surveys. The Contractor shall evaluate whether geophysical surveys are needed (e.g., to determine boundaries of landfills, to locate underground debris, utilities and storage tanks). Where geophysical surveys are appropriate, the Contractor shall select a geophysical survey technique or techniques [such as ground penetrating radar (GPR), magnetometer or electromagnetic surveys (EM)] that will best meet the desired application. The technique(s) used shall be approved by the RTC prior to use. Approximate number of surveying days is included in Annex A which is to be used for costing purposes only. Appropriate grid systems shall be established and the Contractor shall use the results of this survey to prepare a contour map of the results. Provide this map as an attachment to the first R&D Status Report submitted after the completion of the geophysical surveys. The Contractor shall perform the geophysical surveys before drilling and use the results in selecting the location of soil borings, wells, test pits, if necessary.
- 1.3.9.3 Permeability Testing. The Contractor shall determine the need for a permeability test at Cape Lisburne AFS, to provide additional data on the hydrogeologic characteristics of the water table aquifer. The SAP shall specify the method to be used for the permeability test.
- 1.3.9.4 Water Level Measurement. The Contractor shall evaluate the need for conducting a complete round of water level measurements in all existing and new wells at Cape Lisburne AFS at the beginning of field work and during the field sampling effort. Data gathered shall be used for interpreting groundwater flow directions and groundwater gradient.
- 1.3.9.5 **Soil Gas** Surveys. The Contractor shall evaluate the need for soil gas surveys and Hydropunch (e.g., to select soil boring locations). If soil gas surveys and hydropunch are included as part of the approved Work Plan and FSP, the Contractor shall establish appropriate grid systems. The Contractor shall prepare a posting map of soil gas values relative to their location on the grid used. Provide this map as an attachment to the first R&D Status Report submitted after completion of the soil gas survey (sequence 3, para 6.1). Approximate number of surveying days are included in Annex A which is to be used for costing purposes only.
- 1.3.9.6 **Groundwater Field Screening.** The Contractor shall perform groundwater field screening. The SAP shall specify the method, location, and type of groundwater field screening.
- 1.3.9.7 Baseline Risk Assessment. The Contractor shall use data supported by acceptable QA/QC results (as measured against QAPP requirements) and the conceptual site model to numerically estimate the risk posed by site contaminants to human health and the environment. The Contractor shall identify and list all ARARs for those contaminants detected in environmental

samples at the site. The Contractor shall provide all ARARs evaluations as an attachment to the Technical Report. Provide the results of the baseline risk assessment in the Technical Report using the formats in Section 4 of the Handbook as a guidance.

The Contractor shall identify those sites posing minimal or no threat to human health, welfare, or the environment and for which no further action is appropriate.

The Contractor shall use the results of the risk assessment in establishing remedial action objectives and developing remedial alternatives in the Feasibility Study.

- 1.3.9.8 **Defense Priority Model Scores.** The Contractor shall use the Defense Priority Model to score the sites. The score shall be included as an appendix to the RI/FS Technical Report.
- 1.3.9.9 Fate and Transport. The Contractor shall perform fate and transport modeling for contaminants of interest to include the projection of future contaminant concentrations within the boundaries of the site. This will be done in conjunction with the RI/FS report.
- 1.3.10 Feasibility Study (FS). The Contractor shall perform a FS concurrently with the RI. As much of the FS as possible shall be performed early in the RI/FS process and refined as additional RI data are obtained. The Contractor shall use the information from the RI and the baseline risk assessment to develop and evaluate remedial action alternatives for each site where a threat to human health or the environment exists. The Contractor shall follow the procedures specified in USEPA OSWER Directive 9355.3-01, "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA." The Contractor shall employ streamlining methods wherever possible and develop and evaluate the minimum number of alternatives needed to provide a range of promising treatment and containment actions. The Contractor shall eliminate impracticable alternatives from further consideration early in the FS process. The scope and level of detail shall be consistent with the nature and complexity of site problems.
- 1.3.10.1 Develop and Screen Alternatives. The Contractor shall establish remedial action objectives and remediation goals for protecting human health and the environment. These objectives and goals shall be determined based on identified ARARs and acceptable exposure levels as defined in the baseline risk assessment and refined throughout the RI/FS process. Identify general response actions and applicable technologies based on site and contaminant conditions, and combine technologies to formulate distinct alternatives. The Contractor shall develop alternatives which eliminate, control, and /or reduce risk to human health or the environment to acceptable levels for each pathway. Where a wide variety of promising alternatives exists, the Contractor shall screen the alternatives based on effectiveness, implementability, and cost. The Contractor shall detail the development and screening of the alternatives process and identify the alternatives selected for detailed analysis in the Informal Technical Information Report (ITIR).
- 1.3.10.2 Detailed Screening of Alternatives. The Contractor shall conduct a detailed analysis on each alternative selected and identified in the above step and approved by the COR. Using the methodology in OSWER Directive 9355.3-01, the Contractor shall evaluate each alternative against the nine criteria. In addition to the individual assessment, the Contractor shall perform a comparative analysis to determine the relative performance of alternatives. The Contractor shall focus the analysis on sub-factors and criteria most pertinent to each site and the scope and complexity of the

proposed action. Provide a summary of the Detailed Analysis of Alternatives in the R&D report submitted following task completion. Include summary tables of the individual and comparative analyses that will be used in the Technical Report.

- 1.3.11 **Decision Documents.** The Contractor shall prepare and submit Decision Documents (DD) following the Handbook Section 4.4 as guidance. The purpose of the DD is to support a remedial action alternative or a no further action alternative. The Contractor shall submit an Interim Decision Document detailing the removal action process, results and conclusions.
- 1.3.12 **Site Specific Requirements.** The Contractor shall perform the requirements listed in this SOW in conformance with the guidance of the Handbook, requirements of the approved WP, and the SAP. Annex A specifies the proposed values for field and laboratory activities to be conducted, specifications for field activities, information for sediment and soil samples, analytical methods, parameters for analysis, estimated number of analyses for water/sediment/soil samples, required analytical methods, estimated number of analyses for all core samples, estimated number soil gas analyses for each parameter, and field QC sample requirements for soil and water samples for costing purposes only.

1.3.13 Weekly Field Activity Report

The contractor shall transmit a Weekly field activity report. The reports shall include, but not be limited to, all field work detailed in this SOW, a listing of any problems encountered (e.g., equipment problems, equipment downtime), and actions taken to resolve those problems. The AFCEE RTC shall develop the format for the report.

1.3.14 Removal Actions

The Contractor shall complete the following tasks to remove or otherwise control source contamination and further characterize site conditions at Cape Lisburne LRRS. The Contractor shall include any data generated during these activities in the pertinent reports.

- 1.3.14.1 Task 1 involves placement of an interceptor trench (French drain; below Petroleum, Oil, and Lubricant (POL) Tanks 1 and 2 to capture spilled or leaked petroleum products which are currently migrating through the subsurface toward a nearby surface water body. Collected material shall drain to a sump for separation into its water and petroleum components. Accumulated water shall be treated using granulated activated carbon or appropriate vapor control technology, chemically analyzed for the presence of remaining contaminants, and subsequently, in coordination with Alaska Department of Environmental Conservation (ADEC), disposed of according to all applicable water regulations. Recovered petroleum product will be incinerated on-site. after coordination ADEC. Soils excavated to accommodate the trench may be returned to the surrounding land, provided that they are not considered hazardous under the RCRA "contained-in" policy. Soils which are deemed hazardous may be drummed and sent for off-site disposal according to applicable hazardous waste regulations, or may be stored on-site pending subsequent remedial activities.
- 1.3.14.2 Task 2 requires the removal and off-site disposal of a sludge pile located at Landfill and Waste Accumulation Area Number 1. Using a backhoe provided by the base, the sludge pile shall be excavated.

containerized in 55-gallon drums, and transported to a disposal facility in the continental U.S. A temporary drum staging area shall be established nearby to store the drums until they are transported. Current plans may involve shipment of waste on the barge's return trip to Cape Lisburne. Prior to field operations on this task, a representative sample of the sludge must be collected and analyzed using TCLP and other characteristic methods to determine if the material is a hazardous waste. The sludge must be managed and disposed of according to the results of such analyses. After removal of the sludge, the excavated area must also be sampled and analyzed to detect any constituents remaining at the site.

1.3.14.3 Task 3 involves limited PCB sampling and analysis. The purpose of this task is twofold: to further characterize contamination in ocean sediments adjacent to Landfill and Waste Accumulation Area Number 1, and to locate a reported "hot spot" undiscovered during the 1993 RI/FS sampling program.

1.4 Project Deliverables

Deliver the following documents in compliance with the requirements of item VI, the formats required in section 1 and 4 of the Handbook, and the specifications noted below. Draft reports are considered "drafts" only because they have not been reviewed and approved by the Air Force. In all other respects, "drafts" shall be complete, in the proper format, fully illustrated, and free of grammatical and typographical errors.

1.4.1 Scoping Documents.

- a. <u>Engineering Network Analysis (GANTT)</u> (para 1.2.1). Provide within ten (10) days after the issuance of an order. Update and submit quarterly (sequence 3, para 6.1).
- b. <u>Work Plan</u> (para 1.2.2). Use the format in section 1 of the Handbook (sequence 4, para 6.1).
- c. <u>Sampling and Analysis Plan</u> (1.2.3). Use the format in section 1 of the Handbook (sequence 4, para 6.1).
- d. <u>Health and Safety Plan</u> (para 1.2.4). Provide within six (6) weeks after the issuance of an order (sequence 4, para 6.1).
- e. <u>Community Relations Plan</u> (para 1.2.5). Provide within eight (8) weeks after issuance of an order (sequence 4, para 6.1).
- 1.4.2 Special Notification. Provide written notification of imminent health hazards and supporting documentation within three (3) days of telephone notification (sequence 16, para 6.1).
- 1.4.3 Presentation Materials. The Contractor shall prepare and present up to two (2) presentation packages at meetings coordinated by the Air Force (sequence 9, para 6.1). Attendance of these meetings is included in paragraph 1.1.3 of this SOW. As part of the presentation materials, the Contractor shall provide paper copies of all slides and overheads.
- 1.4.4 Meeting Summaries (para 1.1.3). Provide no later than five (5) days after conclusion of each meeting (sequence 18, para 6.1).

- 1.4.5 Newsletter. Prepare and submit a quarterly newsletter which presents the status of the entire base IRP Program. This will include preparing an outline resulting from input by all Contractors involved in the program. The outline must be approved by the base and RTC prior to submittal of the newsletter. The final product will be printed and distributed as agreed to by the RTC. Assume a maximum of two (2) newsletters (Sequence no. 3).
- 1.4.6 Fact Sheets. As required by the base IRP Program, prepare and submit fact sheets which facilitate the public's understanding of the IRP Program. These sheets should include key community concerns regarding sites as specified by the base. Use the format agreed to by the base and RTC. Print and distribute the fact sheets as agreed to by the RTC. Assume a maximum of two (2) fact sheets (Sequence no. 3).
- 1.4.7 **Public Notices.** In accordance with paragraph 1.3.6.2, prepare and submit public notices for the Fairbanks and local newspapers. Use the format agreed to by the base and RTC (Sequence no. 3).
- 1.4.8 **Photo Notebook.** In accordance with paragraph 1.3.6.3, develop a photo notebook which focuses on the overall base IRP Program. The Contractor shall include photos of sites under investigation, field and removal activities, and sample locations. Photos shall reflect proper sampling techniques. CA/OC procedures, and Health and Safety reports during field activities. Prior to implementation, submit a conceptual layout of the notebook for review by the base and RTC (Sequence no. 9).
- 1.4.9 Mailing List. In accordance with the base Community Relations coordinator and paragraph 1.3.6.4, update the existing mailing list on a quarterly basis (Sequence no. 3).
- 1.4.10 Maps. In accordance with the base community Relations coordinator and paragraph 1.3.6.5, prepare presentation quality maps.
- 1.4.11 Information Repository/Administrative Records. Submit the Information Repository and Administrative Records in accordance with Air Force Guidance and in concurrence with the COR and the base Community Relations Coordinator. (sequence no. 4, para 6.1)
- 1.4.12 Data Management. The Contractor shall meet the data deliverable requirements of the Installation Restoration Program Information Management System (IRPIMS). The Contractor shall be responsible for recording field and laboratory data into a computerized format as required by the most current version of the IRPIMS Data Loading Handbook (mailed under separate cover). In order to perform this task, the Contractor shall use the IRPIMS Quality Control Tool (QC Tool) and PC software utility (mailed under separate cover with software manual) to quality check ASCII data files and to check all data files for compliance with requirements in the IRPIMS Data Loading Handbook. Upon request, the IRPIMS Contractor Data Loading Tool (CDLT) is available. This PC software is designed to assist the Contractor in preparing the various ASCII data files.

Individual IRPIMS data files (e.g., analytical results, groundwater level data, etc.), including resubmissions, shall be delivered with a transmittal letter by the Contractor to the Air Force Center for Environmental Excellence (AFCEE) in sequence according to a controlled time schedule as identified in the current version of the IRPIMS Data Loading Handbook. The Contractor shall include a copy of the Quality Control Tool error report, i.e., output from the QC tool, for each IRPIMS file submission. The error report shall be

submitted both in hard copy and as an electronic file on the submission disks with the filename of the error report identified in the transmittal letter (SEQUENCE No. 3).

All Contractor data deliverables shall be sent to:

AFCEE/ESD BLDG 624W
ENVIRONMENTAL RESTORATION DIVISION
ATTN: IRPIMS Data Management
Brooks AFB, TX 78235-5000

In addition, the Contractor shall provide a copy of the transmittal letter to the Air Force contracting office responsible for the contract, HSC/PKV (Brooks AFB, TX, 78235-5000) for AFCEE contracts. This letter shall identify the files included or otherwise omitted (with an appropriate explanation), the Government contract and delivery order number, and the Air Force POC that is responsible for monitoring the Government contract.

The Contractor shall be responsible for the accuracy and completeness of all data submitted. All data entered into the IRPIMS data files and submitted by the Contractor shall correspond exactly with the data contained in the original laboratory reports and other documents associated with sampling and laboratory contractual tasks.

Each file delivered by the Contractor will be electronically evaluated by AFCEE/ESD for format compliance and data integrity in order to verify acceptance. All files delivered by the Contractor are required to be error-free and in compliance with the IRPIMS Data Loading Handbook. Any errors identified by AFCEE/ESD in the submission shall be corrected by the Contractor.

- 1.4.13 Decision Document. The Contractor shall prepare and submit DD as described in Section 1.3.11 (SEQUENCE No. 4, para 6.1).
- 1.4.14 Technical Reports. Summarize the findings of the tasks pursuant to the SOW, integrate them with the results of all pertinent previous studies, and formulate conclusions and recommendations for future efforts in Technical Reports.
- 1.4.14.1. Remedial Investigation (RI) Report (para 1.3.3). Provide a RI Report following the format in section 4 of the Handbook (sequence 4, para 6.1).
- 1.4.14.2. Risk Assessment (RA) Report (para 1.3.3.7). Provide a RA Report following the format in section 4 of the Handbook (sequence 4, para 6.1).
- 1.4.14.3 Feasibility Study Report (para 1.3.4). Provide a Feasibility Study Report following the format in section 4.0 of the Handbook. (sequence 4, para 6.1).
- 1.4.14.4 RI/FS Technical Report (para 1.3.3). Provide a RI/FS Technical Report following the format in section 4.0 of the Handbook. The RI/FS Technical Report shall integrate the RI, RA, and FS reports. Provide two microfiche copies with the final RI/FS Technical Report (sequence 4, para 6.1).

- 1.4.15 Basewide Comprehensive IRP Document. The Contractor shall develop a comprehensive document that summarizes both the historic and projected IRP activities. This document shall be used as management tool to efficiently guide future IRP activities at the DEW Line Sites and Cape Lisburne AFS. The Contractor shall follow the outline developed by the AFCEE RTC. Assume two (2) updates (sequence no. 4)
- 1.4.16 Analytical Data ITIR. Prepare and submit the following ITIRs, as well as the Analytical Data ITIR itself:
- a. <u>Development & Screening of Alternatives</u> (para. 1.3.10.1). Submit the results of the development and screening of alternatives in an ITIR prepared in compliance with section 3 of the Handbook (sequence 3, para 6.1)
 - b. <u>Detailed Screening of Alternatives</u> (para 1.3.10.2).
- c. <u>DPM Scoring</u> (para 1.3.9.8). Provide scores, a summary of procedures and assumptions, and Automated DPM output tables for all sites scored with DPM (sequence 3, para 6.1).
- d. Mylar Map. Construct Radar Stations' maps of Mylar using guidelines in section 3 of the Handbook. The Maps shall contain all sites and related water and sediment sampling locations (sequence no. 3, para. 5.1). The Contractor shall create and update digitized map files. Use the digitized data file to produce the Mylar map. The Contractor shall print the revision date on the Mylar maps and the date shall be encoded in the digitized data file. Provide a copy of the revised digitized data file to AFCEE-ESO/ER (sequence 1, para. 6.2).
- e. <u>Geophysical Survey Contour Map</u> (para 1.3.9.2). Provide a contour map showing geophysical survey results. Interpret the significance of the data in the R&D Status Report (sequence 3, para 6.1).
- f. <u>Soil Gas Map</u> (para 1.3.9.5). Provide site maps showing soil gas data superimposed on the sampling locations and incorporate soil gas data generated by the 11 CEOS/CEOR. Interpret the significance of the data in the R&D Status Report (sequence 3, para 6.1).
- g. <u>Site Characterization Summary Informal Technical Information Report</u> (SCS ITIR). The Contractor shall prepare the report to include the following components:
 - 1. Source identification and contaminant delineation.
- 2. Identification and ranking of appropriate treatability studies for the listed sites.
- 3. Data and interpretations integrating the findings of the current study and all previous RI efforts at the sites.
- 4. Current isoconcentration plots of contaminants detected at each site, lithologic logs of each boring showing contaminants detected and relationship to other borings in the site, and cross-sections of the site showing contaminant distribution.
- 5. The contents and objectives of a Site Characterization Summary Informal Technical Information Report (ITIR) are specified in the Handbook. The Site Characterization Summary ITIR shall serve as a core document for the RI report. The Contractor shall submit an annotated outline of each section of the

ITIR for approval by the TPM prior to preparation of the report itself. The Contractor shall prepare the report as specified in the accepted annotated outline. The Contractor shall submit newly revised portions of the working draft ITIR in order to make available current site characterization data. A prime objective shall be to minimize the volume of comments on the working draft and final submittals by incorporating comments into the report in an on-going manner. The final summary shall contain all sites included in this effort (Sequence No. 4).

h. <u>Weekly Field Activities Report</u> (para 1.3.13). Transmit a Weekly field activities report during field activities pursuant to a format developed by the AFCEE RTC. (Sequence no. 4, para 6.1)

II. Site Location and Dates

Dew Line Sites and Cape Lisburne, date to be established.

III. Base Support The base will:

- 3.1 Provide the Contractor with existing engineering plans, drawings, diagrams, aerial photographs, digitized map files, etc., to facilitate evaluation of IRP sites under investigation.
- 3.2 Arrange for personnel identification badges, vehicles passes, and/or entry permits with the contention the Contractor will provide necessary information to the base personnel no less than four weeks before needed.
- 3.3 Provide the Contractor with all previously approved documents which provide information on all IRP efforts conducted at Dew Line Sites and Cape Lisburne and will aid in the determination of the amount of field work and analyses which need to be conducted.
- IV. Government Furnished Property
 Not Applicable

V. Government Points of Contact:

5.1 MAJCOM — Coordinator

Major-James R. Williams III AFCEE/ERD 8001 Inner Circle DR STE 2 Brooks AFB TX 78235-5328 (210) 536-5243 DSN 210-5343 (210) 536-9026 FAX DSN 240-9026

5.2 Restoration Team Chief

Mr. Michael F. McChee AFCEE/ERD 8001 Inner Gircle DR STE 2 Brooks AFB TX 78235-5328 (210) 536-5393 DSN 340-5293 (210) 536-9036 FAX DSN 340-9036

5.3 Base Point of Contact (POC)

Mr. Jim-Wolfe 11 CEOS/CEVR 21885 Second Street Elmendorf AFB AK 99506-4420 (907) 352-4532 DSN 317-552-1533 FAX DSN 317-552-1533

5.4 Public Affairs Coordinator

Ms. Wende Wolf 11 CEOS/DEVR 21885 Second Street Elmendorf AFB AK 99506-4420 (907) 552-4532 DSN 317-552-4532 (907) 552-1533 FAX DSN 317-552-1533

VI. Deliverables

6.1 Attachment 1 of the Basic Contract

Sequence numbers 1 and 5 listed in attachment 1 to the basic contract apply to all orders. Guidance for preparing R&D Status Reports (sequence 1) is contained in the Handbook, section 4. In addition, the sequence numbers and dates listed below are applicable to this order:

Sequence No.	Para No.	Block 10 (freq.)	Block 11 (as of date)	Block 12 (date of 1st. submit.)	Block 13 (date of final report)	Block 14 (no. of copies)
3 (NETWORK	1.1.4.1a	QTRLY	12APR93	30APR93	a	4
ANALYSIS) 4 (WORK PLAN)	i.1.4.1b	ONE/R	12APR93	30MAY93	30JULY93	ь
4 (WORK PLAN	1.1.4.1b	ONER		2WKSDOA	15SEPT94	<u>m</u>
4 (SAP)	I.1.1.4c	ONE/R	12APR93	30MAY93	30JULY93	ь
4 (SAP	1.1.4.16	ONER		3WKSDOA	15SEPT94	D
ADDENDUM) 4 (HSP)	l.1.4.1d	OTIME	12APR93	30MAY93	-	10
4 (HSP	1.1.4.14	OTIME		2WKSDOA		5
ADDENDUM) 4 (COMM. REL.	1.1.1.4c	ONE/R	12APR93	30MAY93	31 DEC 93	ь
PLAN)	1.1.4.2	OTIME	c	c	-	3
16 (SPECIAL NOTIF.)			ď	ď	_	10
9 (PRESNT. MATERIAL)	1.1.4.3	ASREQ	a	ď		
18 (MTG. RPTS)	1.1.4.4 1.1.4.5	ONE/R OTRLY	c 12 AP R93	30 NO V93	- a	5 f
3 (NEWSLETTER) 3 (FACT SHEETS)	1.1.4.5 1.1.4.6	ASREO	12APR93	1 5JUL 93	g	•
3 (PUBLIC	1.1.4.7	ASREQ	12APR93	1 5JUL 93	g	h
NOTICES) 9 (PHOTO	1.1.4.8	OTIME	12APR93	1 5JUL 93	•	1
NOTEBOOK)	1.1.4.9	OTRLY	12APR93	1 5JUL 93	a	-
3 (MAILING LIST) 3 (MAPS)	1.1.4.10	ÔTIME	12APR93	1 5JUL 93	•	2 2
4 INFO REPOS	1.1.4.11	OTIME	31 JUL 93		31JAN94	2
3 (IRPMS Data ITIR) (Data Management) BCHCON BCHLDI BCHSLI BCHWCI BCHSAMP BCHCALC BCHLTD BCHLTD BCHTEST BCHRES BCHGWD	1.1.4.12	OTIME ONE/R	31JUL93	31 JAN 94	31MAR94	2 b
4 DECISION DOC 4 RI REPORT	I.1.4.13 I.1.4.14.1	ONE/R ONE/R	15SEP93	15FEB94	30APR94	ь
4 RISK ASSESSMENT	Γ 1.1.4.14.2	ONE/R	10CT93	16MAY94 30AUG94	1 5JUL 94	b b
4 FEASIB. STUDY	1.1.4.14.3 1.1.4.14.4	ONE/R ONE/R	30SEPT93 30SEP93	30 X 0C94	IJAN95	ь
4 RVFS Report 4 IRP DOCUMENT	1,14.15	ONE/R	31 TUL 93	31 0CT 93	10DEC93	ь
3 ANALYTICAL		OTIME		01DEC94		2
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ITIR 3 DETAL ANALYSI	S [1.4.16.b	OTIME	28 FEB94	30MAR94	•	10
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3 SOIL GAS MAP I 4 SCS ITTR	1.1.4.16g	ONE/R	· •	<u>01FEB95</u>	OIAPR95	Q
4 SCS ITIR	1.1.4.16g	ONEA	15SEP93	30NOV93	ISFEB94	5
4 WEEKLY ACT RE	P 1.1.4.16h	WEEKLY	13AUG93	13AUG93	•	1

6.2 Reserved.

6.3 Notes

- a. Submit Quarterly Thereafter.
- b. One (1) first draft plan (8 copies), one (1) second draft plan (8 copies), and one (1) final plan (10 copies) are required. Incorporate Air Force comments into the second draft and final plan as specified by the RTC. Supply AFCEE/ESR with an advance copy of the first draft, second draft, and final plan for acceptance prior to distribution. Distribute the remaining copies of each plan as specified by the RTC. The second and final reports shall be submitted within three (3) weeks of receipt of comments from the RTC.
- c. Primary and Secondary Documents. One first draft report (25 copies), one second draft report (25 copies), and one final report (35 bound copies plus the original camera-ready copy and a 3.5 inch disk formatted in WordPerfect 5.1 containing the document file) are required. Incorporate Air Force comments into the second draft and final reports as specified by the RTC. Supply the RTC with an advance copy of the first draft, second draft, and final reports for acceptance prior to distribution. Distribute the remaining copies as specified by the RTC.
- d. Provide written notice with supporting documentation within three (3) days of telephone notification and at the direction of the RTC. Assume a maximum of 100 pages.
 - e. Provide within one (1) week of task/meeting completion.
- f. Provide 500 copies of the Newsletters and distribute as agreed to by the RTC. This includes mailing the final product to on-base personnel and addresses on the existing mailing list.
- g. Provide draft and final deliverables. Provide two advance copies to the AFCEE RTC and to the 11 CEOS Community Relations Coordinator for acceptance prior to preparation of the final deliverables.
 - h. Provide poster-size map.
 - i. Submit with the second draft Technical Report.
 - j. Submit with the Technical Report.
 - k. Provide with the Technical Report.
 - 1. Provide within four (4) weeks of task completion.

m. Both a draft and a final addendum to the existing work plan is required for the removal actions specified in paragraph I.1.3.14. Field removal activities performed at Cape Lisburne LRRS pursuant to paragraph I.1.3.14 of this SOW shall commence upon submittal of the draft work plan to AFCEE for review. The Contractor shall distribute both versions of the work plan as specified by AFCEE.

n. The SAP addendum shall focus on the sampling and analysis activities to be conducted under the removal actions specified in paragraph I.1.3.14 of this SOW. The Contractor shall incorporate any Government comments into the final project-specific SAP. The Contractor shall distribute the SAP as specified by AFCEE.

F33615-90-D-4010, 002204 A+tachment 1 e 19 of 20

o. A Site Characterization Summary ITIR must be prepared based on the findings of sampling and analyses conducted pursuant to the removal action specified in paragraph I.1.3.14. The Contractor shall incorporate any Government comments into the final ITIR. The Contractor shall distribute the ITIR as specified by AFCEE.

Notes+

a		wrated list of analytes is specified under "Parameter" tical protocol shall include all analytes listed in the
	referenced analy	tical method. The methods cited are from the following
	contact and l	
	"A" Methods	Standard Methods for the Examination of Water and Wastewater, 16th Edition (1985)
	E Methods	Methods for Chemical Analysis of Water and Wastes, EPA Manual, 600/4-79-020 (USEPA, 1983with additions)
	"SW" Methods	Test Methods for Evaluating-Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition (USEPA, 1986)
	"ASTM" Methods	American Society for Testing and Materials, 1919 Race Street, Philadelphia, PA 19103
b		The maximum number of second-column confirmation—analyses shall not exseed fifty (50) percent of the—actual number of field samples (to include duplicates, replicates, ambient, condition blanks, trip blanks,—and equipment blanks). If the number of samples—requiring second-column confirmation—exceeds this—allowance, contact the HSD Technical—Project Manager—The total number of samples—listed in Tables A-4 and—A-5 includes the allowance applicable to each GC—method. IF GC/MS, or a combination of second-column—GC and GC/MS, is used, the total cost of all such—analyses for a particular parameter shall not exceed—the funding allowed for positive confirmation using—only second-column GC.

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F33615-90-D-4010-0022-05 Page 2 of 3

- 1. Pursuant to FAR 52.232-7 Payment Under Time-and-Material and Labor-Hours Contracts and in accordance with the provisions of the Basic Contract F33615-90-D-4010 and Delivery Order 0022, Mod. 05 the above delivery order is amended. The purpose of this modification is to increase the ceiling amount of this order by \$330,000.00 to cover the total cost of the efforts being requested. The ceiling is being increased to cover existing work.
- 2. As a result of paragraph 1 above, said order is more specifically modified as follows:
- a. SECTION A Cover Page: The ceiling amount in Block 20 (cover page) is increased by \$330,000.00 from \$3,528,878.00 to \$3,858,878.00.
 - b. SECTION B Supplies/Services: is amended as set forth below.

Item No.	Supplies Schedule	Qty Purch Unit	Unit Price
0001	CLIN Change Sec Class: U Noun: Sampling, Analysis, and Data Acm: XA nsn: N Sites Codes: pqa: D acp: D fob:	D	N
0002	CLIN Change Sec Class: U Noun: Support Acm: XA nsn: N Sites Codes: pqa: D acp: D fob:	D	И
0004	CLIN Change Sec Class: U Noun: Chemical Analysis & Data Acm: XA nsn: N Sites Codes: pqa: D acp: D fob:	D	N
	pr/mipr data: FY7624-94-08822		

F33615-90-D-4010-0022-05 Page 3 of 3

b. SECTION G Accounting Classification Data: is amended as set forth below:

Appropriation/Lmt Subhead/CPN Recip DODAAD Obligation
ACRN Acet Class Data Supplemental Accounting Classification Amount

AD Account Establish

\$330,000.00

Unclassified 57

5743400

F74400

304 7434 434419 040000 53475 000000 674400

pr/mipr data: FY7624-94-08822 (PR Complete)

descriptive data: AF Form 616 H94-SR-365 dated: 18 Aug 94 expiration: 22 Sep 94

XA Special ACRN Establish

descriptive data: Special ACRN XA Funds CLINs 0001, 0002, and 0004 and includes the following:

AA: \$ 299,855.00 (Basic DO)

AB: 99,986.00 (Mod. -01)

2,899,511.00 (Mod. -02)

AC: 229,526.00 (Mod. -04)

AD: <u>330.000.00</u> (Mod. -05)

TOTAL \$3,858,878.00

Finance Officer: Pay funds in alphabetical order.

- 3. Concurrence to this Unilateral Agreement is evidenced by contractor's (ICF) letter dated 8 Jun 94, incorporated herein by reference.
- 4. All other terms and conditions remain unchanged and in full force and effect.

REF 68X

68X AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT PAGE 1 0 REQUESTION/PURCHASE REQUEST BOG/DMB RATING PROG INSTRUMENT ID NO. (PIN) SPIIN EFFECTIVE DATE PROJECT NO. F33615-90-D-4010 002206 27MAR95 FY7624-95-08452 DO-C9 INSUED BY B. ADMINISTERED BY (IF OTHER THAN BLOCK 7) CODE FA8900 S2404A DEPARTMENT OF THE AIR FORCE DCMAO BALTIMORE AIR FORCE MATERIEL COMMAND CHESAPEAKE ATTN: HUMAN SYSTEMS CENTER 200 TOWSONTOWN BOULEVARD, WEST 21204-5299 8005 9TH STREET MOSWOT MD BROOKS AFB TX 78235-5353 EDWIN CUSTODIO /PKVBA Buver: (210) 536-4493 Phone: CONTRACTOR IS. BEQUETY CLAS 69418 FACILITY CODE 0006 U TOT TECHNOLOGY, INC. F W FOR MULTIPLE 11. DISCOUNT FOR PROMPT PAYMENT 9300 LEE HIGHWAY PACILITIES ADVANCE COP FAIRFAX, VA 22301-3000 HET A DAYM **\$**7 OTHER DAYE COUNTY: FAIRFAX ND 138 PHONE: (703)934-3000 DAYS BEST TE BD 12. PURCHASE OFFICE PORT OF CONTACT MVH/M1U/MVH 12. THIS BLOCK APPLIES CHELY TO AMENDMENTS OF SOUTCITATIONS 14. THIS BLOCK APPLIES ONLY TO MODIFICATION OF CONTRACTS THE CHANGE IS SET FORTH HEREIN ARE MADE TO THE ARGVED NUMBERED CONTRACT/ORDER. THE ABOVE NUMBERED CONTRACT IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (SUCH AS CHANGES IN PAYING OFFICE, APPROPRIATION THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF MODIFIEE THE ABOVE NUMBERED CONTRACT AS SET FORTH HEREIN. THIS MODIFICATION IS ISSUED PURSUANT TO IAW FAR 52.232-7 PAYMENT UNDER TEM AND LABOR HOURS 15. CONTRACT ADMINISTRATION DATA E LOSING PO/GAO C. DATE OF SIGNATURE D. CHANGE IN CONTRACT AMOUNT INCREASE (+) DECREASE (-) GAINING PO/CAD SVO/AGENCY KIND OF MOD MOD AREST a ON TRANSPER ON TRANSFER RECIPIENT ADP PT SECTION G ENTER ANY APPLICABLE CHANGES 16. B. OF ANNUAL DATE L SECURITY C. CONTRACT F. SPL CONTR Q. PAYING OFC H. DATE SIGNED A CODE D. CONTR OF AWARD CENT CODE (1) CLAS (2) DATE OF DO 354 (1) TYPE (2) KIND HEMARKS (Encour as provided hards), as from and commissions of the contract CEILING PRICE PROJECT MANAGER: SAMER KARMI, AFCEE/ERD, BROOKS AFB TX 78235-5353 FINANCE OFFICE: (SC1030) DFAS-COLUMBUS CENTER, DFAS-CO/CHESAPEAKE DIV P O BOX 182264, COLUMBUS 43218-2264 OH CONTRACTOR/OFFEROR IS NOT REQUIRED CONTRACTOROFFEROR IS REQUIRED TO BIGN THIS DOCUMENT AND RETURN TO GIGN THIS DOCUMENT COPIES TO ISSUING OFFICE CONTRACTORIORFERIOR (Eligination of person surrented to sign) L UNITED STATES OF AMERICA nature of Contracting Officer) - Zam EL DATE BIONED NAME AND TITLE OF BIGNER (Type or pres) DATE MONED < mar 2)</p> LARRISON JANELLE

F33615-90-D-4010-0022-06 Page 2 of 4

- 1. Pursuant to FAR 52.232-7 Payment Under Time-and-Material and Labor-Hours Contracts and in accordance with the provisions of the Basic Contract F33615-90-D-4010 and Delivery Order 0022, Mod. 06 the above delivery order is amended. The purpose of this modification is to increase the ceiling amount of this order by \$315,000.00 to cover the total cost of the efforts being requested. The ceiling is being increased to cover existing work in the revised Work Plan.
- 2. As a result of paragraph 1 above, said order is more specifically modified as follows:
- a. SECTION A Cover Page: The ceiling amount in Block 20 (cover page) is increased by \$315,000.00 from \$3,858,878.00 to \$4,173,878.00.
 - b. SECTION B Supplies/Services: is amended as set forth below.

Item No.	Supplies Schedule	Qty Purch Unit	Unit Price
1000	CLIN Change Sec Class: U		N
	Noun: Sampling, Analysis, and Data		
	Acm: XA nsn: N		
	Sites Codes: pqa: D acp: D fob:	D	
0002	CLIN Change Sec Class: U		N
	Noun: Support		
	Acm: XA nsn: N		
	Sites Codes: pqa: D acp: D fob:	D	
0004	CLIN Change Sec Class: U		N
	Noun: Chemical Analysis & Data		
	Acm: XA nsn: N		
	Sites Codes: pqa: D acp: D fob:	D	
	pr/mipr data: FY76-95-08452		•

F33615-90-D-4010-0022-06 Page 3 of 4

c. SECTION F Supplies schedule Data: The delivery schedule is modified as set forth below:

Item No.	Supplies Schedule Data		Delivery Quantity	Schedule Date
0001	CLIN Del Sch Change acm: XA ship to: U	Sec Class: U	1	96 Jan 31
0002	CLIN Del Sch Change acm: XA ship to: U	Sec Class: U	. 1	96 Jan 31
0 004	CLIN Del Sch Change acm: XA ship to: U	Sec Class: U	1	96 Jan 31

b. SECTION G Accounting Classification Data: is amended as set forth below:

Appropriation/Lmt Subhead/CPN Recip DODAAD
ACRN Acet Class Data Supplemental Accounting Classification Amount

AE Account Establish
Unclassified 5753400
305 7434 434419 040000 53440 000000 674400

pr/mipr data: FY7624-95-08452 (PR Complete)

descriptive data: AF Form 616 H95-SR-298 dated: 1 Mar 95, expiration 15 Sep 95.

F33615-90-D-4010-0022-06 Page 4 of 4

XA Special ACRN Establish

descriptive data: Special ACRN XA Funds CLINs 0001, 0002, and 0004 includes the following:

AA: \$ 299,855.00 (Basic DO)

AB: 99,986.00 (Mod.-01)

2,899,511.00 (Mod.-02)

AC: 229,526.00 (Mod.-04)

AD: 330,000.00 (Mod.-05) AE: 315,000.00 (Mod.-06)

\$4,173,878.00

Finance Officer: Pay funds in alphabetical order.

- 3. Concurrence to this Unilateral Agreement is evidenced by contractor's (ICF) letter dated 18 Jan 95, incorporated herein by reference.
- 4. All other terms and conditions remain unchanged and in full force and effect.

APPENDIX D SAMPLE COLLECTION LOGS

SAMPLE COLLECTION LOGS FOR THE DEACTIVATED LANDFILL (LF01)

DATE: <u>09/07/93</u>			s	AMPLE I	D: <u>LAY-LF</u>	01-2SW10				
RADAR STATION: P										·
SITE/AOC: Landfill L										
FIXED POINT: <u>Down</u>										<u>° to radome.</u>
SAMPLE MATRIX:										
SAMPLERS: JU	7.45									
SAMPLERS: <u>JD</u> TIME SAMPLED: <u>11</u> SAMPLE DESCRIPTI	ON/COMM	ENTO: 0	D	EPIH O	F SAMPLE	(feet):				
SAMPLE DESCRIPTI	ON/COMM	EN15: <u>3</u>	same i	ocation	as LF01-2S	D13.				<u> </u>
SAMPLING METHOD): Grab									
QA/QC SAMPLES C	OLLECTED	: 🗆 E	quipm	nent Blai	nk (EB)	☐ QA/QC Ex	tra Vol	umes		
☐ Trip Blank (TB)			uplica	te of Wa	ater Sample	ID				
☐ Ambient Condition	n Blank (Al	B) 🗆 F	Replica	te of Sc	il Sample II	<u> </u>		T		
			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	WA	TER PARA	METERS				
TIME	PH		CON	DUCTIV	/ITY	TEMPERATURE	SPE	CIFIC GRAVIT	ΥΙ	URBIDITY
				-						
			-							
				MON	IITORING R	EADINGS		r		
TIME	DID DEAD	NNC (nn	\	00"	-I (0/)	HANBY SCREEN	NING			
TIME	PID READ	лич (рр	my	CG/L	EL (%)	(standard/ppm)				
BG=Background;	BZ=Breath	ing Zone	; BH=	Boreho	le; NR=No	Readings; HS=Hea	adspac	e; S=Sample	(uncor	ntained)
			1	CHECK	ANALYSES	REQUESTED				
			BARI	ROW LA	\B			ANCHO	RAGE	LAB
ANALYSES			CON	TAINER	IS	ANALYSES	/	CON	TAINE	RS
		٧	VATER		SOIL	7.1.0.1.0.2.0		WATER		SOIL
ТРН		1 liter			8 oz	VOC (8260)	/	3 x 40 ml		4 oz
PCB						SVOC (8270)		1 liter		8 oz
PESTICIDES						TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40	ml	T	4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	/	1 1 7 70	1111		402	TDS		250 ml		
VPH	1			<u> </u>		TSS		250 ml		***
						! !				
EPH		<u> </u>				TOC		500 ml		4 oz
		<u> </u>				TCLP		2 liters		2 x 8 oz
										•

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; Ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>09/07/93</u>			SAN	MPLE II	D: <u>LAY-LF(</u>)1-2SW09				
ADAR STATION: Point Lay WEATHER: Rainy, breezy, 35°F										
TE/AOC: Landfill LF01 FEET FROM FIXED POINT: MAGNETIC HEADING: XED POINT: Upstream of SS07-SD04 & SW04, 346° to SE corner of hangar, 384.5° to SW corner of hangar, 359° to radome.										
FIXED POINT: Upstre	eam of SS0	7-SD04 8	& SW04,	<u>, 346° t</u>	o SE corne	r of hangar, 384.5° to	SW c	orner of hanga	ar, 359	o to radome
SAMPLE MATRIX: [SAMPLERS: JD	Soil (S)	□s	edimen	nt (SD)		Surface Water (SW)		Groundwater	(GW)	
TIME SAMPLED: 17	7:30		DEI	PTH O	SAMPLE	(foot):				***************************************
SAMPLE DESCRIPTION										
OAIVII EE BEGOIIII III	014,00111111		anto io	<u>oanon</u>	<u> </u>	<u> </u>				****
SAMPLING METHOD	: Grab									
QA/QC SAMPLES CO	OLLECTED					☐ QA/QC Ex				
☐ Trip Blank (TB)			uplicate	e of Wa	iter Sample	ID				
☐ Ambient Conditio	n Blank (Al	3) 🗆 R	eplicate	of Soi	il Sample II)				
					TER PARAM					
TIME	PH		COND	DUCTIV	ΙΤΥ	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY
							 			
	<u> </u>						-			
				MON	ITORING R	EADINGS				
						HANBY SCREEN	IING			
TIME	PID READ	ING (pp	m)	CG/LE	EL (%)	(standard/ppm)				
50 5-1	D7 Dua -4h	· 7			le: ND Ne	Deedings, US_Uss	donoo	o: C-Campia	(upper	rtainod)
BG=Background;	BZ=Breath	ing Zone	; BH=E	Sorenoi	e; NH=NO	Readings; HS=Hea	iuspaci	e, 5=5ample	(uncor	itairieu)
			√ 0	CHECK	ANALYSES	REQUESTED				
			BARR	OW LA	В.			ANCHO	RAGE	LAB
ANALYSES			CONT	AINER	S	ANALYSES	/	CON	TAINE	RS
		W	VATER		SOIL			WATER		SOIL
TPH		1 liter			8 oz	VOC (8260)	1	3 x 40 ml		4 oz
РСВ						SVOC (8270)		1 liter		8 oz
PESTICIDES						TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40	ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	VOC-BTEX 8020 ✓ TDS 250 ml									
VPH	1					TSS		250 ml		
EPH	1					тос		500 ml		4 oz
						TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: <u>08/24/93</u>			SA	MPLE I	D: LAY-LFO	01-SD01				
RADAR STATION: Po	oint Lay		WE	ATHER	R: Sunny, 5	0°F				
SITE/AOC: Deactivate	ed Landfill	<u>LF01</u>	FE	ET FRO	M FIXED P	OINT: <u>100</u>	١	MAGNETIC HE	ADINO	3: <u>48.5°</u>
FIXED POINT: South										
SAMPLE MATRIX:			edimer	nt (SD)		Surface Water (SW)		Groundwater	(GW)	
SAMPLERS: JP, DN,										
TIME SAMPLED: <u>16:</u> SAMPLE DESCRIPTIC	20	ENITO: L	DE	PTH O	F SAMPLE	(feet):	Come l	naction on OW	24 0	
brown.	/N/COMMIN	EN 13. <u>LI</u>	Bacriale	Suean	i at northear	st comer of landilli.	same i	ocation as Syv	01. OI	ganic muck,
SAMPLING METHOD:	Grab			*						
QA/QC SAMPLES CO		: DE	quipm	ent Blar	nk (EB)	☐ QA/QC Ex	tra Volu	umes		
☐ Trip Blank (TB)			uplicat	e of Wa	ater Sample	ID				
☐ Ambient Condition	Blank (Al	B) 🗆 R	leplicat	e of So	il Sample II)				
					TER PARAM					
TIME	PH		CONI	DUCTIV	'ITY	TEMPERATURE	SPE	CIFIC GRAVIT	ΥT	URBIDITY
		7								
							<u> </u>	·	_	
									+	
	<u> </u>						ļ			
				MON	ITORING R	EADINGS				
						HANBY SCREEN	IING			
TIME	PID READ	ING (pp	m)	CG/LE	L (%)	(standard/ppm)				
			ļ							
BG=Background; E	BZ=Breath	ina Zone	: BH=	Boreho	le: NR=No	Readings: HS=Hea	dspace	e: S=Sample	(uncor	rtained)
,_									(4.1.00)	
			<u> </u>	CHECK	ANALYSES	REQUESTED				
			BARR	ROW LA	\B			ANCHO	RAGE	LAB
ANALYSES	1		CON	TAINER	S	ANALYSES	/	CON	TAINE	RS
		W	VATER		SOIL			WATER		SOIL
TPH	1	1 liter			8 oz	VOC (8260)		3 x 40 ml		4 oz
РСВ	1					SVOC (8270)		1 liter		8 oz
PESTICIDES						TOTAL METALS		1 liter		8 oz
HVOC 8010	1	1 x 40	ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1					TDS		250 ml		
						TSS		250 ml		
						тос		500 ml		4 oz
						TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>08/24/93</u>			SA	MPLE I	D: <u>LAY-LFC</u>)1-SD02				
RADAR STATION: Po	oint Lay		WE	EATHER	: <u>Sunny, 5</u>	0°F				
SITE/AOC: Deactivate	ed Landfill	LF01	FE	ET FRO	M FIXED P	OINT: 204	N	IAGNETIC HE	ADING	6: <u>104°</u>
FIXED POINT: South										
SAMPLE MATRIX:		= 8	Sedime	nt (SD)		Surface Water (SW)		Groundwater	(GW)	
SAMPLERS: JP, DN						// A ·				
TIME SAMPLED: <u>16</u> SAMPLE DESCRIPTIO	:15 DN/COMM	ENITO: A	DE	PTH OF	SAMPLE	(feet):	odfill S	ame location :	as SW	02 Organic
muck (silt).					Water at 50	utileast comer or lai	idilli. O	amo location	<u> </u>	oz. Organio
SAMPLING METHOD										
QA/QC SAMPLES CC		☐ E	Equipm	ent Blar	ık (EB)	☐ QA/QC Ext	tra Volu	ımes		
☐ Trip Blank (TB)						ID			*	
☐ Ambient Condition	n Blank (AE	3) 🗆 F	Replica	te of So	il Sample II)				
				WA	TER PARAM	METERS				
TIME	PH		CON	DUCTIV	ITY	TEMPERATURE	SPE	CIFIC GRAVIT	ΥΤ	URBIDITY
Tivic	1		-							
	1						1			
		•		MON	ITORING R	EADINGS				
		••				HANBY SCREEN	IING			
TIME	PID READ	ING (pp	om)	CG/LE	L (%)	(standard/ppm)				
									-	
BG=Background:	BZ=Breath	ina Zon	e: BH=	Boreho	le: NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncor	ntained)
Da Dading, oanie, i										
					*	S REQUESTED				
	ļ		BARI	ROW LA	.В 			ANCHO	DHAGE	: LAB
ANALYSES	1		CON	ITAINER	S	ANALYSES	1	CON	TAINE	RS
		١	WATER	1	SOIL			WATER		SOIL
ТРН	1	1 liter		*************************************	8 oz	VOC (8260)		3 x 40 ml		4 oz
РСВ	1					SVOC (8270)		1 liter		8 oz
PESTICIDES						TOTAL METALS		1 liter		8 oz
HVOC 8010	1	1 x 40) ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1					TDS		250 ml		
						TSS		250 ml		
						тос		500 m!		4 oz
						TCLP		2 liters		2 x 8 oz
IL		<u> </u>			·					

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; Ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: <u>08/24/93</u>			SAN	MPLE I	D: <u>LAY-LF0</u>	1-SD03					
	ADAR STATION: Point Lay WEATHER: Sunny, 50°F										
SITE/AOC: Deactivat	ed Landfill	LF01	FEE	ET FRO	M FIXED P	OINT: <u>268</u>	^	MAGNETIC HE	ADINO	3: <u>110.5°</u>	
FIXED POINT: South	east corne	r of landfi	II.					····			
SAMPLE MATR€X: □	• •		edimen	nt (SD)		Surface Water (SW)		Groundwater	(GW)		
SAMPLERS: <u>JP, DN</u>										····	
TIME SAMPLED: 16											
SAMPLE DESCRIPTION				stream	s on beach	beyond southeast c	orner of	landfill. Same	location	on as SW03.	
Gravelly sand, minor		rown/gra	. <u>V</u> .								
SAMPLING METHOD				51	L (CD)	T 04/00 5	· · · · · · · · · · · · · · · · · · ·				
QA/QC SAMPLES CO											
☐ Trip Blank (TB) ☐ Ambient Conditio	n Piant /Al					ID					
Ambient Conditio	II BIAIIK (AL	o) Li ne	врисан							1	
	Т	I			TER PARAN		Τ				
TIME	PH		CONE	DUCTIV	ITY	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY	
				MON	ITORING R	EADINGS					
						HANBY SCREEN	IING				
TIME	PID READ	ING (ppr	<u>n) </u>	CG/LE	L (%)	(standard/ppm)			_		
		_									
			1								
BG=Background;	BZ=Breath	ina Zone:	: BH=8	Borehol	e: NR=No	Readings: HS=Hea	dspace	e: S=Sample (uncor	tained)	
						REQUESTED					
			BARR	OW LA	В			ANCHO	RAGE	LAB	
ANALYSES	1		CONT	TAINER	S	ANALYSES	1	CON	TAINE	RS	
		W	ATER		SOIL			WATER		SOIL	
TPH	1	1 liter			8 oz	VOC (8260)		3 x 40 ml		4 oz	
РСВ	1					SVOC (8270)		1 liter		8 oz	
PESTICIDES						TOTAL METALS		1 liter		8 oz	
HVOC 8010	1	1 x 40 r	ml		4 oz	DISS METALS		1 liter			
VOC-BTEX 8020	1				TDS		250 ml				
						TSS		250 ml			
						тос		500 ml		4 oz	
						TCLP		2 liters		2 x 8 oz	

Preservation:

HVOC and VOC: HCI to pH <2; metals: HNO₃ to pH <2; Ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>08/24/93</u>			SAMPLE	ID: <u>LAY-LF</u>	01-SD04		····		
	FATION: Point Lay WEATHER: Sunny, 50°F								
SITE/AOC: <u>Landfill Ll</u>	F01		FEET FRO	OM FIXED P	POINT: 204	<u> </u>	MAGNETIC HE	ADING	9: <u>157°</u>
FIXED POINT: South									
SAMPLE MATRIX: [SAMPLERS: <u>JP, DN</u>		■ Sec	diment (SD)		Surface Water (SW)		Groundwater	(GW)	
TIME SAMPLED: 14			DEPTH O	E SAMPLE	(feet):				
SAMPLE DESCRIPTION								Same	location as
SW04. Silty gravel.									
SAMPLING METHOD									
QA/QC SAMPLES CO			uipment Bla	nk (EB)	QA/QC Ex	tra Volu	umes		
☐ Trip Blank (TB)					ID				
☐ Ambient Condition	n Blank (AE								
			WA	TER PARA	METERS				
TIME	PH		CONDUCTIV	VITY	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY
	1		MON	NITORING R	EADINGS				
			10101	THE THE		IINC		1	
TIME	PID READ	ING (ppm	n) CG/L	EL (%)	HANBY SCREEN (standard/ppm)	NING			
BG=Background;	BZ=Breath	ing Zone;	BH=Boreho	ole; NR=No	Readings; HS=Hea	dspac	e; S=Sample	(uncor	ntained)
					S REQUESTED				
		1	BARROW L				ANCHO	RAGE	LAB
			CONTAINE		ANALYSES	,		TAINE	
ANALYSES	<i>J</i>			1	ANALYSES	<i>-</i>			SOIL
			ATER	SOIL			WATER	-77-22	
TPH	/	1 liter		8 oz	VOC (8260)	/	3 x 40 ml		4 OZ
PCB	1				SVOC (8270)	1	1 liter		8 oz
PESTICIDES	/				TOTAL METALS	/	1 liter		8 oz
HVOC 8010	/	1 x 40 m	nl	4 oz	DISS METALS		1 liter		
VOC-BTEX 8020					TDS		250 ml		
					TSS		250 ml		
					TOC	1	500 ml		4 oz
					TCLP		2 liters		2 x 8 oz
				<u> </u>					

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: 08/24/93			SAI	MPLE II	D: <u>LAY-LF(</u>)1-SD05				
RADAR STATION: P	oint Lay		WE	ATHER	: Sunny, 5	0°F				
SITE/AOC: Landfill L							\	MAGNETIC HE	ADING	9: <u>143°</u>
FIXED POINT: South								<u></u>		
SAMPLE MATRIX:	Soil (S)	■ Se	edimen	nt (SD)		Surface Water (SW)		Groundwater	(GW)	
SAMPLERS: JP, DN										
TIME SAMPLED: 15										
SAMPLE DESCRIPTION	ON/COMMI	ENTS: <u>Su</u>	urface v	vater po	ool along we	est edge of landfill. S	ame lo	cation as SW0	5. Silt	y gravel with
organic muck.										
SAMPLING METHOD										
QA/QC SAMPLES CO	DLLECTED					☐ QA/QC Ex				
☐ Trip Blank (TB)						ID			*	
☐ Ambient Conditio	n Blank (Al	3) ⊔ R	eplicate	e of So	il Sample II) 				
				WA	TER PARAM	METERS	.,			
TIME	PH	1	CONE	DUCTIV	ITΥ	TEMPERATURE	SPE	CIFIC GRAVIT	ү т	URBIDITY
	 								_	
									\dashv	
				MON	TORING R	EADINGS				:
						HANBY SCREEN	IING			
TIME	PID READ	EADING (ppm)			L (%)	(standard/ppm)				
						†				
BG=Background;	BZ=Breath	ing Zone	; BH=E	Borehol	e; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncor	tained)
			/ (CHECK	ANALYSES	REQUESTED				
			BARR	OW LA	R			ANCHO	RAGE	LAR
			•							
ANALYSES	1		CONT	TAINER	S	ANALYSES	/	CON	TAINE	RS
		w	ATER		SOIL			WATER		SOIL
TPH	1	1 liter			8 oz	VOC (8260)		3 x 40 ml		4 oz
РСВ	1					SVOC (8270)		1 liter		8 oz
PESTICIDES						TOTAL METALS		1 liter		8 oz
HVOC 8010	1	1 x 40 ı	ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1					TDS		250 ml		
					-	TSS		250 ml		***
		TOC 500 ml						4 oz		
		TCLP						2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

		s <i>i</i>								
RADAR STATION: <u>P</u>	oint Lay	w	EATHER	: <u>Sunny, 5</u>	0°F					
SITE/AOC: <u>Landfill L</u>			ET FRO	M FIXED P	OINT: <u>57</u>	м	AGNETIC HEA	DING	: <u>211.5°</u>	
FIXED POINT: South										
SAMPLE MATRIX: [SAMPLERS: <u>JP, DN</u>		Sedime	nt (SD)		Surface Water (SW)		Groundwater (GW)		
TIME SAMPLED: 14	:50	DE	EPTH OF	SAMPLE	(feet):					
SAMPLE DESCRIPTION	ON/COMME	NTS: Surface	water a	long northw	rest corner of landfill	. Same	location as S\	N07.	Organic silt,	
muck, occasional gra										
SAMPLING METHOD	: Grab									
QA/QC SAMPLES CO	DLLECTED:	☐ Equipm	ent Blar	nk (EB)	☐ QA/QC Ex	tra Volu	ımes			
☐ Trip Blank (TB)					ID					
☐ Ambient Conditio	n Blank (AE	3) 🗌 Replica	te of So	il Sample II)					
			WA	TER PARAM	METERS					
TIME	РН	CON	DUCTIV	ΊΤΥ	TEMPERATURE	SPE	CIFIC GRAVIT	URBIDITY		
			MON	ITORING R	EADINGS					
TIME	PID READ	OING (ppm)	CG/LE	EL (%)	HANBY SCREEN (standard/ppm)	IING				
			<u> </u>							
BG=Background;	BZ=Breath	ing Zone; BH=	Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample (uncon	tained)	
					S REQUESTED					
			ROW LA		, included the second s		ANCHO	RAGE	LAB	
ANALYSES	1	CON	ITAINER	IS	ANALYSES	/	CON	AINE	HS	
		WATER	}	SOIL			WATER		SOIL	
ТРН	1	1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz	
РСВ	1				SVOC (8270)		1 liter		8 oz	
PESTICIDES					TOTAL METALS		1 liter		8 oz	
HVOC 8010	1	1 x 40 ml	1	4 oz	DISS METALS		1 liter			
VOC-BTEX 8020	1				TDS		250 ml			
					TSS		250 ml			
					тос		500 ml		4 oz	
					TCLP		2 liters		2 x 8 oz	
						<u> </u>				

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: <u>08/24/93</u>			SA	MPLE I	D: <u>LAY-LF(</u>	01-SD07				
RADAR STATION: P										
SITE/AOC: Landfill L				ET FRO	M FIXED P	OINT: 114	N	MAGNETIC HEA	DING	3: <u>264°</u>
FIXED POINT: South	west corne	r of hand	ıar.							
SAMPLE MATRIX:	Soil (S)	S S	edimer	nt (SD)		Surface Water (SW)		Groundwater (GW)	
SAMPLERS: <u>JP, DN</u>				·		- Allen and Arabana and Araban				
TIME SAMPLED: <u>14</u>										
SAMPLE DESCRIPTION		ENTS: <u>Su</u>	urface	water be	ody adjacer	nt to POL line. Same	locatio	n as SW07. Sa	ndy c	ravel, minor
fines, organic matter										
SAMPLING METHOD				·····						
QA/QC SAMPLES CO	OLLECTED									
☐ Trip Blank (TB)						ID				
Ambient Conditio	n Blank (Al	3) LIR	eplicat	e of So	il Sample II)				
				WA [*]	TER PARA	METERS				
TIME	PH		CON	DUCTIV	'ITY	TEMPERATURE	SPE	CIFIC GRAVITY	• т	URBIDITY
									+	
							-			
				MON	ITORING R	EADINGS				
		HANBY SCREENING								
TIME	PID READ	PID READING (ppm)			L (%)	(standard/ppm)				
			l			<u> </u>				
BG=Background;	BZ=Breath	ing Zone	; BH=	Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample (u	ıncon	itained)
			1	CHECK	ANALYSES	S REQUESTED				
			BARE	ROW LA	B			ANCHO	RAGE	LAB
					***				2	
ANALYSES	/		CON	TAINER	S	ANALYSES	>	CONT	AINE	RS
		W	ATER		SOIL			WATER		SOIL
ТРН	1	1 liter			8 oz	VOC (8260)		3 x 40 ml		4 oz
РСВ	1					SVOC (8270)		1 liter		8 oz
PESTICIDES						TOTAL METALS		1 liter		8 oz
HVOC 8010	1	1 x 40	ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1					TDS		250 ml		
						TSS		250 ml		
						тос		500 ml		4 oz
						TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; Ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: 08/24/93			SA	MPLE !	D: <u>LAY-LF(</u>	01-SD08					
RADAR STATION: P	oint Lay		W	EATHER	: Sunny, 5	0°F					
SITE/AOC: Landfill L							N	IAGNETIC HE	ADING	i: <u>157°</u>	
FIXED POINT: South											
SAMPLE MATRIX:	Soil (S)	■ S	edime	nt (SD)		Surface Water (SW)		Groundwater	(GW)		
SAMPLERS: JP, DN	I, AP										
TIME SAMPLED: 14	1:15 (14:20	on bottle	es) DE	PTH OF	SAMPLE	(feet):					
SAMPLE DESCRIPTION	ON/COMM	ENTS: <u>F</u>	Replica	te of LF	01-SD04. S	Silty gravel, organic	materia	l present.			
										<u> </u>	
SAMPLING METHOD				Calm Brids				-	<u> </u>		
QA/QC SAMPLES CO	OLLECTED				ık (EB)		tra Volu	umes			
☐ Trip Blank (TB)			•		•	ID					
☐ Ambient Conditio	n Blank (Al	B) 📕 F	leplica	te of So	il Sample II	LAY-LF01-SD04					
				WA [*]	TER PARA	METERS					
TIME	PH		CON	DUCTIV	'ITY	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY	
							<u> </u>				
				MON	ITORING R	FADINGS					
				11.011		T	IINC		<u> </u>		
TIME	PID READ	DING (pp	m)	CG/LE	EL (%)	HANBY SCREEN (standard/ppm)	IING				
13312	1 10 112312),,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	,			(_		
BG=Background;	BZ=Breath	ing Zone	e; BH=	Boreho	le; NR=No	Readings; HS=Hea	dspac	e; S=Sample	(uncor	tained)	
				CHECK	ANALYSES	S REQUESTED					
				ROW LA				ANCHO	RAGE	IAR	
ANALYSES	1		CON	TAINER	S	ANALYSES	1	CON	TAINE	RS	
		v	VATER		SOIL			WATER		SOIL	
TPH	1	1 liter			8 oz	VOC (8260)	1	3 x 40 ml		4 oz	
РСВ	1	1				SVOC (8270)	1	1 liter		8 oz	
PESTICIDES	1					TOTAL METALS	1	1 liter		8 oz	
HVOC 8010		1 x 40	ml	T	4 oz	DISS METALS		1 liter			
1	1	1 X 40	1111		4 02						
VOC-BTEX 8020		_			<u> </u>	TDS		250 ml			
						TSS		250 ml			
						500 ml		4 oz			
	TCLP 2 liters 2 x a							2 x 8 oz			

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: 08/24/93		8	SAMPLE	D: LAY-LF	01-SD09					
RADAR STATION: P	oint Lay	\	VEATHER	R: <u>Sunny, 5</u>	60°F					
SITE/AOC: Landfill L						N	MAGNETIC HEA	DING	i: <u>127°</u>	
FIXED POINT: South										
SAMPLE MATRIX: [Soil (S)	Sedim	ent (SD)		Surface Water (SW)		Groundwater (0	(WE		
SAMPLERS: <u>JP, DN</u>										
TIME SAMPLED: 15										
SAMPLE DESCRIPTI	ON/COMM	ENTS: <u>Leact</u>	nate strea	m on beac	n, off center of land	ill. G	ravelly sand, mi	nor fi	nes. Soil is	
SAMPLING METHOD										
QA/QC SAMPLES C	OLLECTED:				☐ QA/QC Ex					
☐ Trip Blank (TB)		☐ Duplic	ate of Wa	ater Sample	ID		··			
☐ Ambient Condition	n Blank (Al	3) LI Replic	ate of Sc	oil Sample II)					
			WA	TER PARA	METERS					
TIME	PH	co	NDUCTIV	/ITY	TEMPERATURE	SPE	CIFIC GRAVITY	т	URBIDITY	
								\top		
						 		+		
						-		+		
			MON	IITORING R	EADINGS	-				
HANBY SCREENING										
TIME	PID READ	ING (ppm)	CG/LI	EL (%)	(standard/ppm)					
								+		
			. i		_l		<u> </u>			
BG=Background;	BZ=Breath	ing Zone; BH	=Boreho	ole; NR=No	Readings; HS=Hea	dspac	e; S=Sample (u	ncon	rtained)	
			CHECK	ANALYSE	S REQUESTED					
	ļ	BA	ROW LA	AΒ			ANCHOR	RAGE	LAB	
ANALYSES	1	CO	NTAINEF	 RS	ANALYSES	1	CONT	AINE	RS	
		WATE	R	SOIL			WATER		SOIL	
TPH	1	1 liter	=	8 oz	VOC (8260)		3 x 40 ml		4 oz	
РСВ	1				SVOC (8270)		1 liter		8 oz	
PESTICIDES					TOTAL METALS		1 liter		8 oz	
HVOC 8010	1	1 x 40 ml		4 oz	DISS METALS		1 liter			
VOC-BTEX 8020	1				TDS		250 ml			
	TSS 250 ml									
					тос		500 ml		4 oz	
					TCLP		2 liters		2 x 8 oz	

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; Ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>08/24/93</u>			SA	MPLE I	D: <u>LAY-LF0</u>	1-SD10				
RADAR STATION: PO	int Lay		WE	ATHER	: Sunny, 5	0°F				
SITE/AOC: Landfill LF	01		FE	ET FRO	M FIXED P	OINT: <u>285</u>	M	AGNETIC HE	ADING	i: <u>140°</u>
IXED POINT: Southe										
SAMPLE MATRIX:		S	Sedime	nt (SD)		Surface Water (SW)		Groundwater ((GW)	
SAMPLERS: <u>JP, DN,</u> FIME SAMPLED: <u>15:</u>			חב	DTU OF	CAMPLE	(foot):				
SAMPLE DESCRIPTION									of lan	dfill. Sandy
gravel, minor silt, orga										
SAMPLING METHOD:		<u> p. 000.</u>								
QA/QC SAMPLES CC			Equipm	ent Blan	k (EB)	☐ QA/QC Ext	ra Volu	ımes		
☐ Trip Blank (TB)						ID				
☐ Ambient Condition	n Blank (AE									
				WAT	TER PARAN	METERS				
TIME	PH		CON	DUCTIV	ITΥ	TEMPERATURE	SPE	CIFIC GRAVIT	ΥT	URBIDITY
THOIL	+ ' ' '		3071							
							ļ			
			I	MON	ITORING R	FADINGS	<u> </u>			
				WIOIN	TOTAL OF		IINIC			
TIME	PID READ	ING (pr	om)	CG/LE	E (%)	HANBY SCREEN (standard/ppm)	IING	i		
LIMIC	11011212	110 (pr	21119		(,,,					
BG=Background; I	BZ=Breath	ing Zon	e; BH=	Boreho	e; NR=No	Readings; HS=Hea	dspace	e; S=Sample (uncor	ntained)
			1	CHECK	ANALYSES	REQUESTED				
			BAR	ROW LA	В.			ANCHO	RAGE	LAB
ANALYSES			CON	ITAINER	S	ANALYSES	1	CON	TAINE	RS
, , , , , , , , , , , , , , , , , , , ,		\	WATER		SOIL			WATER		SOIL
ТРН	1	1 liter	- 17/4 P		8 oz	VOC (8260)		3 x 40 ml		4 oz
PCB	1					SVOC (8270)		1 liter		8 oz
PESTICIDES						TOTAL METALS		1 liter		8 oz
HVOC 8010	1	1 x 40) ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1					TDS		250 ml		
						TSS		250 ml		
						тос		500 ml	-	4 oz
						TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: <u>08/24/93</u>			SAMPLE I	D: <u>LAY-LF</u> ()1-SD11					
RADAR STATION: P										
SITE/AOC: Landfill L	F01	!	EET FRO	OM FIXED P	OINT: 310	\	MAGNETIC HE	ADING	3: <u>260°</u>	
FIXED POINT: South	west corne	r of hangar.								
SAMPLE MATRIX:	Soil (S)	Sedin	nent (SD)		Surface Water (SW)		Groundwater	(GW)		
SAMPLERS: JP, DN		·								
TIME SAMPLED: 14							***			
SAMPLE DESCRIPTION	ON/COMMI	ENTS: Pool	to southw	est of POL	area. Organic silt.					
SAMPLING METHOD). Grah									
QA/QC SAMPLES CO		· D Fouir	ment Blac	nk (ER)	☐ QA/QC Ex	tra Voli	imae			
☐ Trip Blank (TB)	OLLLOILD				ID					
☐ Ambient Conditio	n Blank (Al									
WATER PARAMETERS										
TIME	T DU	00				005	OIFIO ODAVIT	, T -		
TIME	PH	100	NDUCTIV	/11 Y	TEMPERATURE	SPE	CIFIC GRAVIT	<u> </u>	URBIDITY	
	<u> </u>		· · · · · · · · · · · · · · · · · · ·							
	MONITORING READINGS									
		HANBY SCREENING								
TIME	PID READ	ING (ppm)	CG/LE	EL (%)	(standard/ppm)	IING				
			1	<u> </u>						
								╫		
					I				<u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>	
BG=Background;	BZ=Breath	ing Zone; Bh	l=Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncor	ntained)	
			/ CHECK	ANALYSES	REQUESTED					
		ВА	RROW LA	ΛB			ANCHO	RAGE	LAB	
ANALYSES		CC	NTAINER	ıs	ANIALVOTO	,		TAINE		
ANALIGEO				1	ANALYSES					
		WATE	:H	SOIL			WATER		SOIL	
TPH	/	1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz	
PCB	1				SVOC (8270)		1 liter		8 oz	
PESTICIDES					TOTAL METALS		1 liter		8 oz	
HVOC 8010	1	1 x 40 ml		4 oz	DISS METALS		1 liter			
VOC-BTEX 8020	1	TDS 250 ml								
					TSS		250 ml			
					тос		500 ml		4 oz	
					TCLP		2 liters		2 x 8 oz	

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>09/07/93</u>			SA	MPLE I	D: <u>LAY-LF</u> (01-2SD12				
RADAR STATION: P								N. 100 P. 1		
SITE/AOC: <u>Landfill L</u>										
FIXED POINT: Upstre	eam of AOC	4-SD04	<u>& SW0</u>	4, 346°	to SE corne	er of hangar, 309.5° t	o SW c	orner of hanga	ar, 359	o to radome
SAMPLE MATRIX:			Sedime	nt (SD)		Surface Water (SW)		Groundwater	(GW)	
SAMPLERS: <u>JD, SS</u> TIME SAMPLED: <u>17</u>		<u></u>	D.F.	DTU O	CAMPLE	(foot):			-	
SAMPLE DESCRIPTION									locatio	on as AOC4
2SW09.	OTA/OOTAITAIL	_1410. <u>D</u>	IIICK III	OOK WILL	large arrior	and or gold to ordings	uigui ii	atorial. Carrio	TOOULI	
SAMPLING METHOD): Grab (so	coop)								
QA/QC SAMPLES C			Eguipm	ent Blar	nk (EB)	☐ QA/QC Ex	tra Volu	umes		
☐ Trip Blank (TB)						ID				
☐ Ambient Conditio	n Blank (Al	3) 🗆 F	Replicat	te of So	il Sample II)				
				WA	TER PARA!	METERS				
TIME	PH		CON	DUCTIV	ΊΤΥ	TEMPERATURE	SPE	CIFIC GRAVIT	ΥT	URBIDITY
				MON	ITORING R	EADINGS				
						HANBY SCREEN	IING			
TIME	PID READ	ING (pp	om)	CG/LEL (%)		(standard/ppm)				
BG=Background;	BZ=Breath	ing Zon	e; BH=	Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncor	itained)
				CHECK	ANALYSES	S REQUESTED				
			BAR	ROW LA	λB			ANCHO	RAGE	LAB
ANALYSES	1		CON	TAINER	S	ANALYSES	1	CON	TAINE	RS
		٧	VATER		SOIL			WATER		SOIL
ТРН		1 liter			8 oz	VOC (8260)	>	3 x 40 ml	,	4 oz
РСВ				1		SVOC (8270)		1 liter		8 oz
PESTICIDES						TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40	ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	TEX 8020					TDS		250 ml		
						TSS		250 ml		
						тос		500 ml	г	4 oz
						TCLP		2 liters		2 x 8 oz
			· · · · · · · · · · · · · · · · · · ·						-	

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: <u>09/07/93</u>			SA	MPLE I	D: <u>LAY-LF</u>	01-2SD13				
RADAR STATION: P	oint Lay		W	EATHER	R: Rain, 25	mph wind, 34°F				
SITE/AOC: Landfill L	F01		FE	ET FRO	M FIXED F	OINT:	MA	AGNETIC HEA	DING:	
FIXED POINT: Downs	stream of LI	F01-SW0	4 & SE	004, 297	o to SW col	ner of hangar, 322°	to SE c	orner of hanga	ır, 348	° to radome.
SAMPLE MATRIX:		■ S	Sedime	nt (SD)		Surface Water (SW)		Groundwater	(GW)	
SAMPLERS: JD, SS								***************************************		
TIME SAMPLED: 17							'41' - \			
SAMPLE DESCRIPTION	UN/COMMI	=N12: B	iack m	ucky gra	avei with so	me orange algai (lim	Onitic)	material, Sam	e locat	ion as LF01-
2SW10. SAMPLING METHOD	: Grab (se	coop)					····			
QA/QC SAMPLES CO			auipm	ent Blar	nk (EB)	☐ QA/QC Ex	tra Volu	ımes		
☐ Trip Blank (TB)						ID				
☐ Ambient Conditio	n Blank (Al									
				WA ⁻	TER PARA	METERS				
TIME	PH		CON	DUCTIV	'ITY	TEMPERATURE SPECIFIC GRAVITY			ΥT	URBIDITY
										· · · · · · · · · · · · · · · · · · ·
				MON	ITORING R	EADINGS	•		•	
						HANBY SCREEN	IING			
TIME	PID READ	ING (pp	m)	CG/LEL (%)		(standard/ppm)	*****			
BG=Background;	BZ=Breath	ing Zone	ə; BH=	Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncor	ntained)
			1	CHECK	ANALYSES	S REQUESTED				
			BAR	ROW LA	.В			ANCHO	RAGE	LAB
ANALYSES			CON	ITAINER	S	ANALYSES	1	CON	TAINE	RS
		v	VATER		SOIL		,	WATER		SOIL
ТРН		1 liter		;; ·	8 oz	VOC (8260)	1	3 x 40 ml		4 oz
РСВ						SVOC (8270)		1 liter		8 oz
PESTICIDES						TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40	ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020		TDS 250 ml								
						TSS		250 ml		
						тос		500 ml		4 oz
						TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>09/07/93</u>			SA	MPLE II	D: <u>LAY-LF(</u>	01-2SD14					
RADAR STATION: PO											
SITE/AOC: <u>Landfill Ll</u>											
FIXED POINT: Uptrea	am of LF01-	-SW04, S	SD04, ir	n adjace	ent leachate	stream to LF01-2SV	V09, 29	SD12, 2 feet no	th an	d 6 feet east	
of LF01-2SW09.											
SAMPLE MATRIX:	Soil (S)		Sedime	nt (SD)		Surface Water (SW)		Groundwater (GW)		
SAMPLERS: <u>JD, SS</u>											
TIME SAMPLED: <u>18</u>	:00		DE	PTH OF	SAMPLE	(feet):					
SAMPLE DESCRIPTION			Black a	nd dark	brown mot	tled gravelly muck t	vith sig	<u>inificant organic</u>	mate	erial	
SAMPLING METHOD											
QA/QC SAMPLES CO	DLLECTED:										
☐ Trip Blank (TB)	· · · · ·					ID					
Ambient Condition	n Blank (Al	3) Lif	teplicat	e of Sol	ii Sampie IL)					
				WA ²	TER PARAM	METERS					
TIME	PH		CON	DUCTIV	ΊΤΥ	TEMPERATURE	SPE	CIFIC GRAVITY	, T	URBIDITY	
THALE	1 ' ' '		00.11	500111					+		
				MON	ITORING R	EADINGS		r			
						HANBY SCREEN	IING			-	
TIME	PID READ	ING (pp	m)	CG/LE	L (%)	(standard/ppm)			_		
DC Background	D7Brooth	ina Zon		Porobo	lo: NP-No	Readings; HS=Hea	denace	e: S=Sample (i	incor	tained)	
BG=Background;	bZ=breatri	ing zon	a, DN=	DOIGHO	ie, inn=ino	neadings, 115-11ed	uspace	s, o-oample (311001	itali loaj	
			1	CHECK	ANALYSES	REQUESTED					
			BARF	ROW LA	ιB			ANCHO	RAGE	LAB	
			001	TAILED			_	CONT	AINE	DC .	
ANALYSES	/		CON	TAINER	S	ANALYSES	/	CONT	AINE	no :	
		V	VATER		SOIL			WATER		SOIL	
ТРН		1 liter			8 oz	VOC (8260)	1	3 x 40 ml		4 oz	
РСВ						SVOC (8270)		1 liter		8 oz	
PESTICIDES						TOTAL METALS		1 liter		8 oz	
HVOC 8010		1 x 40	ml		4 oz	DISS METALS		1 liter			
VOC-BTEX 8020						TDS		250 ml			
						TSS		250 ml			
		тос						500 ml		4 oz	
						TCLP		2 liters		2 x 8 oz	

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>08/24/93</u>			SA	MPLE I	D: <u>LAY-LF</u> (01-SW01				
RADAR STATION: P										
SITE/AOC: Landfill L	F01		FE	ET FRO	M FIXED F	OINT: 100	N	MAGNETIC HE	ADING	i: <u>48.5°</u>
FIXED POINT: South	neast corne	r of hang	ar.							
SAMPLE MATRIX: [Soil (S)	□s	edime	nt (SD)		Surface Water (SW)		Groundwater	(GW)	
SAMPLERS: <u>JP, DN</u>	I, AP									
TIME SAMPLED: 16										
SAMPLE DESCRIPTI	ON/COMM	ENTS: <u>L</u>	eacha	te strear	m at northe	ast corner of landfill	Same	location as S	D01.	
CAMPLING METLOS). Orah									
SAMPLING METHOD			·	ant Dia	-l. (CD)	[] 04/00 F:	\/al-			
QA/QC SAMPLES Co Trip Blank (TB)	OLLEGIED									
☐ Ambient Condition	n Blank (ΔI	ev □ B	uplicat	e of So	il Samola II	ID				
The second contains	T Blaim (A	رر 	Орноа							
	1	1		WA'	TER PARA	METERS	1			
TIME	PH		CON	DUCTIV	'ITY	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY
16:20	7.3		300 µ	S		10°C	1.00	0		
						·	1		_	
		,				İ	1			
				MON	ITORING P	EADINGS		·		
						HANBY SCREEN	IING			
TIME	PID READ	DING (pp	m)	CG/LE	EL (%)	(standard/ppm)				
BG=Background:	B7=Breath	ing Zone	· BH=	Boreho	ie: NR=No	Readings; HS=Hea	dspace	e: S=Sample i	(uncor	tained)
To buong out it,	DE 0.000.0	9 20110						o, o campio	(011001	
		Γ		CHECK	ANALYSE	S REQUESTED				
			BARF	ROW LA	\B			ANCHO	RAGE	LAB
ANALYSES	1		CON	TAINER	s	ANALYSES	1	CON	TAINE	RS
		W	/ATER		SOIL			WATER		SOIL
TPH	1	1 liter			8 oz	VOC (8260)		3 x 40 ml		4 oz
РСВ	1					SVOC (8270)		1 liter		8 oz
PESTICIDES						TOTAL METALS		1 liter		8 oz
		1 :: 40			4.00					
HVOC 8010	/	1 x 40	1111		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020						TDS		250 ml		
	TSS 250 ml									
						тос		500 ml		4 oz
						TCLP		2 liters		2 x 8 oz
										İ

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

ADAR STATION: Point Lay WEATHER: Sunny, 50°F										
SITE/AOC: Landfill LF01 FEET FROM FIXED POINT: 204 MAGNETIC HEADING: 104°										
FIXED POINT: South										
SAMPLE MATRIX: SAMPLERS: <u>JP, DN</u>		□ S	edime	nt (SD)	= \$	Surface Water (SW)		Groundwater	(GW)	
TIME SAMPLED: 16		· · · · · · · · · · · · · · · · · · ·	DE	PTH OF	SAMPLE	(feet):				
SAMPLE DESCRIPTION							ındfill.	Same location	as S[002.
SAMPLING METHOD	: <u>Grab</u>									
QA/QC SAMPLES CO	DLLECTED:	□ E	quipm	ent Blan	nk (EB)	☐ QA/QC Ex	tra Volu	umes		
☐ Trip Blank (TB)			uplicat	te of Wa	iter Sample	ID				· · · · · · · · · · · · · · · · · · ·
☐ Ambient Condition	n Blank (AE	3) 🗆 R	eplicat	e of Soi	il Sample II)				
				WA	TER PARAM	METERS				
TIME	PH		CON	DUCTIV	ΊΤΥ	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY
16:15	7.1		550 μ	S		12°C				
		<u> </u>								
				MON	ITORING R	EADINGS				
TIME	PID READ	iNG (ppi	m)	CG/LE	EL (%)	HANBY SCREEN (standard/ppm)	IING			
		· · · · · ·								
BG=Background;	BZ=Breath	ing Zone	; BH=	Boreho	le; NR=No	Readings; HS=Hea	dspac	e; S=Sample	(uncor	itained)
				CHECK	ANALYSES	S REQUESTED				-
								ANCHO	DRAGE	LAR
			DAR	ROW LA	ND					
ANALYSES	1		CON	TAINER	S	ANALYSES	1	CON	TAINE	RS
		W	/ATER		SOIL		,n	WATER		SOIL
ТРН	\	1 liter			8 oz	VOC (8260)		3 x 40 ml		4 oz
РСВ	1					SVOC (8270)		1 liter	···	8 oz
PESTICIDES						TOTAL METALS		1 liter		8 oz
HVOC 8010	1	1 x 40	ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1					TDS		250 ml		
						TSS		250 ml		
						тос		500 ml	·	4 oz
						TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: <u>08/24/93</u>			SA	MPLE	D: LAY-LF	01-SW03				
	AR STATION: Point Lay WEATHER: Sunny, 50°F									
SITE/AOC: Landfill L							N	IAGNETIC HEA	ADING	i: <u>260°</u>
FIXED POINT: South	nwest corne	er of hang	gar.							
SAMPLE MATRIX: [Soil (S)	□s	edime	nt (SD)	= :	Surface Water (SW)		Groundwater	(GW)	
SAMPLERS: JP, DN					· · · · · · · · · · · · · · · · · · ·	****				
TIME SAMPLED: 14	1:30		DE	PTH O	SAMPLE	(feet):				
SAMPLE DESCRIPTION	ON/COMMI	ENTS: <u>Le</u>	achate	stream	is on beach	beyond southeast c	orner c	f landfill. Same	locat	ion as SD03
04400 NO METHOD										
SAMPLING METHOD										
QA/QC SAMPLES CO										
	· · · · ·	, C	uplica	te of Wa	ter Sample	ID				
Ambient Condition	n Blank (Al	B) LIH	leplicat	e of So	il Sample II)				
				WA ⁻	TER PARA	METERS				
TIME	PH		CON	DUCTIV	'ITY	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY
14:30	7.8		410 µ	S		9°C	1.00	0		
							 		+-	
				MON	ITORING R	EADINGS				
						HANBY SCREEN	IING			
TIME	PID READ	ING (pp	m)	CG/LE	L (%)	(standard/ppm)				
									ŀ	
BG-Background:	R7—Breath	ina Zone	. BH-	Roreho	le: NP-No	Readings; HS=Hea	denac	o: S-Sample /	· · · · · · · · · · · · · · · · · · ·	rtainod)
BG=Background,	DZ-DIGATI	ing Zone					uspaci	s, 3—Sample	(GI ICOI	itali lea)
		<u> </u>		CHECK	ANALYSES	REQUESTED				
			BAR	ROW LA	.B			ANCHO	RAGE	LAB
ANALYSES	1		CON	TAINER	S	ANALYSES	1	CON	TAINE	RS
		٧	VATER		SOIL			WATER		SOIL
TPH	1	1 liter			8 oz	VOC (8260)		3 x 40 ml		4 oz
РСВ	1					SVOC (8270)		1 liter		8 oz
PESTICIDES						TOTAL METALS		1 liter		8 oz
HVOC 8010	1	1 x 40	ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	EX 8020 🗸					TDS		250 ml		
						TSS		250 ml		
						тос		500 ml		4 oz
						TCLP		2 liters		2 x 8 oz
	TOLI Z INGIO Z A GZ									

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>08/24/93</u>			SAN	MPLE II	D: <u>LAY-LF</u> ()1-SW04				
ADAR STATION: Point Lay WEATHER: Sunny, 50°F ITE/AOC: Landfill LF01 FEET FROM FIXED POINT: 204 MAGNETIC HEADING: 157°										
SITE/AOC: Landfill L	F01		FEE	T FRO	M FIXED P	OINT: <u>204</u>	N	MAGNETIC HE	ADING	6: <u>157°</u>
FIXED POINT: South										
SAMPLE MATRIX: [SAMPLERS: <u>JP, DN</u>	• •	☐ Sed	dimen	t (SD)	■ \$	Surface Water (SW)		Groundwater	(GW)	
TIME SAMPLED: 15			_ DEF	PTH OF	SAMPLE	(feet):				
SAMPLE DESCRIPTION	ON/COMMI	ENTS: Int	ersect	ion of	leachate st	reams near southwe	est corr	ner of landfill.	Same	location as
SD04.	<u></u>									
SAMPLING METHOD	: Grab									
QA/QC SAMPLES CO	DLLECTED:	: 🗆 Eq	uipme	nt Blan	k (EB)	☐ QA/QC Ex	tra Volu	umes		
☐ Trip Blank (TB)			•		•	ID				
Ambient Conditio	n Blank (Al	3) 🗌 Re _l	plicate	of Soi	I Sample II)				
	<u> </u>			WA	TER PARAM	METERS				
TIME	PH		COND	UCTIV	ITY	TEMPERATURE	SPE	CIFIC GRAVIT	ΥT	URBIDITY
15:10	7.2		810 μ	S		9°C	1.00	0		
									1	
				MON	ITORING R	EADINGS				
						HANBY SCREEN	IING			
TIME	PID READ	ING (ppm	1)	CG/LE	L (%)	(standard/ppm)				
BG=Background;	BZ=Breath	ing Zone;	BH=E	3orehol	e; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncor	ntained)
			/ (CHECK	ANALYSES	S REQUESTED				
				OW LA				ANCHO	RAGE	LAB
								COM	TAINE	DC .
ANALYSES	/		CONT	TAINER	5	ANALYSES	/			1
		W.A	ATER		SOIL			WATER	<u>.</u>	SOIL
ТРН	1	1 liter			8 oz	VOC (8260)	1	3 x 40 ml		4 oz
РСВ	1					SVOC (8270)	1	1 liter		8 oz
PESTICIDES	1					TOTAL METALS	1	1 liter		8 oz
HVOC 8010	1	1 x 40 m	n!		4 oz	DISS METALS	1	1 liter		
VOC-BTEX 8020	1					TDS	1	250 ml		
						TSS	1	250 ml		
						тос	1	500 ml		4 oz
						TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: 08/24/93			SA	MPLE II	D: LAY-LFO	01-SW05				
RADAR STATION: Point Lay WEATHER: Sunny, 50°F										
SITE/AOC: Landfill L	F01		FE	ET FRO	M FIXED P	OINT: <u>135</u>	N	MAGNETIC HE	ADING	i: <u>143°</u>
FIXED POINT: South	west corne	r of han	gar.							
SAMPLE MATRIX:	Soil (S)		edime	nt (SD)	3 8	Surface Water (SW)		Groundwater (GW)	
SAMPLERS: JP, DN										
TIME SAMPLED: 15										
SAMPLE DESCRIPTION	ON/COMMI	ENTS: S	Surface	water p	ool along v	vest edge of landfill.	Same	location as SI	D05.	

SAMPLING METHOD										
QA/QC SAMPLES CO	DLLECTED:					☐ QA/QC Ex				
☐ Trip Blank (TB)	n Diamir (Af	. □ c	uplica	e of Wa	iter Sample	ID				
Ambient Conditio	n biank (At	D)	replicat	9 01 50	i Sample IL					
				WA	TER PARAM	METERS				
TIME	PH		CON	DUCTIV	IΤΥ	TEMPERATURE	SPE	CIFIC GRAVIT	/ T	URBIDITY
15:00	7.4		460 µ	S		12°C	1.00	0		
				MON	ITORING R	EADINGS				
						HANBY SCREEN	IING			
TIME	PID READ	ING (pp	m)	CG/LE	L (%)	(standard/ppm)				
1										
BG-Background:	R7-Breath	ina Zone		Boreho	le: NR-No	Readings; HS=Hea	denace	s: S-Sample (uncor	tained)
Ba-background,	DZ-DIGATI	ing zone	3, DI I	DOIGIO	e, INC	Neadings, 115-1166	uspace	s, 5-Sample (uricus	italiieu)
			1	CHECK	ANALYSES	REQUESTED				
			BARF	ROW LA	В			ANCHO	RAGE	LAB
ANALYSES	1		CON	TAINER	S	ANALYSES	/	CONT	TAINE	RS
		v	VATER		SOIL			WATER		SOIL
ТРН	1	1 liter			8 oz	VOC (8260)		3 x 40 ml		4 oz
РСВ	/	, ,,,,,,,			0 02	SVOC (8270)		1 liter		8 oz
	-							I		
PESTICIDES						TOTAL METALS		1 liter		8 oz
HVOC 8010					4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1			<u> </u>		TDS		250 ml		
						TSS		250 ml		
						тос		500 ml		4 oz
						TCLP		2 liters		2 x 8 oz
	TOLP Z INTERS Z X 8 0Z									

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>08/24/93</u>			_SAMPLE II	D: LAY-LFO	1-SW06				
RADAR STATION: Po	oint Lay WEATHER: Sunny, 50°F								
SITE/AOC: Landfill LI	-01		_FEET FRO	M FIXED P	OINT: <u>57</u>	M	AGNETIC HEA	ADING	211.5°
FIXED POINT: South	west corne	r of hangar	•						
SAMPLE MATRIX:	Soil (S)	☐ Sed	iment (SD)	■ 9	Surface Water (SW)		Groundwater	(GW)	
SAMPLERS: <u>JP, DN</u>	, AP								
TIME SAMPLED: 14	:45		_ DEPTH OF	SAMPLE	(feet):				
SAMPLE DESCRIPTION	ON/COMME	ENTS: Sur	face water a	long northy	vest corner of landfi	I. Sam	e location as	SD06.	
									
SAMPLING METHOD			-						
QA/QC SAMPLES CO	LLECTED:								
☐ Trip Blank (TB)					ID				
☐ Ambient Condition	n Blank (AE	3) 🗆 Rep	licate of So	il Sample ID					
			WA ⁻	TER PARAN	METERS				
TIME	PH	C	CONDUCTIV	'ITY	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY
14:45	7.8	4	80 μS		11°C	1.00	1		
								_	
						<u> </u>			
			MON	ITORING R	EADINGS				
					HANBY SCREEN	ING			-
TIME	PID READ	ING (ppm)	CG/LE	EL (%)	(standard/ppm)				
					<u> </u>				
BG=Background;	BZ=Breath	ing Zone; E	3H=Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncon	tained)
			✓ CHECK	ANALYSES	REQUESTED			•	
			BARROW LA	B			ANCHO	RAGE	LAB
ANALYSES	1	(CONTAINER	S	ANALYSES	1	CON	TAINE	RS
		WA [*]	TER	SOIL			WATER		SOIL
TPH	1	1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz
РСВ	1				SVOC (8270)		1 liter		8 oz
PESTICIDES				l	TOTAL METALS		1 liter		8 oz
HVOC 8010	1	1 x 40 m	1	4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	TEX 8020 🗸				TDS		250 ml		
TSS					TSS		250 ml		
					тос		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: <u>08/24/93</u>			SA	MPLE II	D: LAY-LFO	01-SW07				
RADAR STATION: PO	oint Lay WEATHER: Sunny, 50°F									
SITE/AOC: Landfill L	F01		FE	ET FRO	M FIXED P	OINT: 114	N	IAGNETIC HE	ADING	3: <u>264°</u>
FIXED POINT: South										
SAMPLE MATRIX:	Soil (S)	☐ Se	edime	nt (SD)		Surface Water (SW)		Groundwater	(GW)	
SAMPLERS: JP, DN										
TIME SAMPLED: 14										
SAMPLE DESCRIPTION	ON/COMMI	ENTS: <u>S</u>	urface	water p	ool adjace	nt to POL line. Sam	e locat	ion as SD07.		
SAMPLING METHOD	. Grah									
				ont Plon			tra Voli		·	
QA/QC SAMPLES CO Trip Blank (TB)	JLLECTED.				• •	ID				
☐ Ambient Conditio	n Riank (Al							***************************************		
The state of the s										
	1				TER PARA		1			
TIME	PH		CON	DUCTIV	'ITY	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY
14:40	7.1		900 μS			14°C	1.00	1		
							<u> </u>			
			γ	MON	ITORING R	EADINGS				
						HANBY SCREEN	IING			
TIME	PID READ	ING (ppr	m)	CG/LE	L (%)	(standard/ppm)			_ _	
						1				
BG=Background:	BZ=Breath	ina Zone	: BH=	Boreho	le: NR=No	Readings; HS=Hea	dspac	e: S=Sample (uncor	ntained)
		Γ		CHECK	ANALYSES	S REQUESTED				
			BAR	ROW LA	AB			ANCHO	RAGE	LAB
ANALYSES	1		CON	TAINER	s	ANALYSES	1	CON	TAINE	RS
		w	/ATER		SOIL			WATER		SOIL
TPH	1	1 liter			8 oz	VOC (8260)		3 x 40 ml		4 oz
PCB	1					SVOC (8270)		1 liter		8 oz
PESTICIDES	-			!	1	TOTAL METALS		1 liter		8 oz
HVOC 8010	1	1 x 40	ml		4 oz	DISS METALS		1 liter	·	
VOC-BTEX 8020	1	1 7 40	•••		402	TDS		250 mi		
VOC-BTEX 8020				<u>.</u>	1			250 ml		
						TSS				4
						TOC	<u> </u>	500 ml		4 oz
						TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>08/24/93</u>	/93									
RADAR STATION: PO	oint Lay WEATHER: Sunny, 50°F									
SITE/AOC: Landfill L	F01		FE	ET FRO	M FIXED P	OINT: 204		MAGNETIC HE	EADING	G: <u>157°</u>
FIXED POINT: South	east corne	r of hand	ar.							
SAMPLE MATRIX:] Soil (S)	□s	edime	nt (SD)	= 9	Surface Water (SW)		Groundwater	(GW)	
SAMPLERS: JP, DN										
TIME SAMPLED: 15										
SAMPLE DESCRIPTION	ON/COMMI	ENTS: _li	ntersec	tion of	leachate st	reams near southwe	est corr	ner of landfill.	Same	location as
SD04.										
SAMPLING METHOD										
QA/QC SAMPLES CO	DLLECTED									
☐ Trip Blank (TB)	DI: 1 (4)					ID LAY-LF01-SW0	<u> </u>		 	
☐ Ambient Condition	n Blank (Al	3) LIH	eplicat	e of So	II Sample IL)				
				WA ⁻	TER PARAM	METERS				
TIME	PH		CON	DUCTIV	ΊΤΥ	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY
15:10	7.2		810 µ	S		9°C	1.00	1		
				MON	ITORING R	EADINGS				
						HANBY SCREEN	IING			
TIME	PID READ	ING (pp	m)	CG/LE	L (%)	(standard/ppm)				
DC Beekerswadt	D7 - Brooth	ina Zana		Poreho	lo: ND-No	 Readings; HS=Hea	denace	s: S-Sample	(uncor	ntained)
BG=Background;	DZ=Dream	ing zone	, bn=	BUIGIO	ie, inn=ino	neadings, no-nea	uspace	s, 0=0ample	(di looi	itali looj
			1	CHECK	ANALYSES	REQUESTED	-			
			BARF	ROW LA	B			ANCHO	RAGE	LAB
ANALYSES	1		CON	TAINER	S	ANALYSES	1	CON	TAINE	RS
		٧	VATER		SOIL			WATER		SOIL
TPH	1	1 liter			8 oz	VOC (8260)	1	3 x 40 ml		4 oz
РСВ	1					SVOC (8270)	1	1 liter		8 oz
PESTICIDES	1					TOTAL METALS	1	1 liter		8 oz
HVOC 8010	✓ 1 x 40 ml 4 oz DISS METALS ✓ 1 liter									
VOC-BTEX 8020	TDS 250 m						250 ml			
						TSS	1	250 ml		
						тос	1	500 ml		4 oz
						TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

SAMPLE COLLECTION LOGS FOR THE GARAGE (SS06)

		SA									
RADAR STATION: Point Lay WEATHER: Partly cloudy, slight breeze, 45°F SITE/AOC: Garage SS06 FEET FROM FIXED POINT: 25 MAGNETIC HEADING:											
								NG:	**		
FIXED POINT: 25 fee											
SAMPLE MATRIX:	• •	☐ Sedime	nt (SD)		Surface Water (SW)		Groundwater (G	iW)			
SAMPLERS: <u>JP, RC</u>					4						
TIME SAMPLED: 11							leese sliebth.	!-			
SAMPLE DESCRIPTION	ON/COMMI	ENTS: <u>Undern</u>	eam gai	age. Brow	n to dark brown sar	idy Siit,	loose, slightly r	noisi			
SAMPLING METHOD):										
QA/QC SAMPLES CO	OLLECTED:	: 🗌 Equipm	ent Blar	nk (EB)	☐ QA/QC Ex	ra Volu	umes				
☐ Trip Blank (TB)		☐ Duplica	te of Wa	ater Sample	ID						
☐ Ambient Conditio	n Blank (Al	3) 🗌 Replica	te of So	il Sample ID)						
				TER PARAM							
TIME	РН	CON	DUCTIV	'ITY	TEMPERATURE	SPE	CIFIC GRAVITY	Ττ	URBIDITY		
								+			
BG=0.5			MON	ITORING R	EADINGS						
HANBY SCREENING											
TIME	PID READ	ING (ppm)	CG/LE	EL (%)	(standard/ppm)						
11:15	25 ppm ir	n BH									
	7.5 in BZ							┼			
								<u></u>			
BG=Background;	BZ=Breath	ing Zone; BH=	Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample (u	ncor	ntained)		
		1	CHECK	ANALYSES	REQUESTED						
		BAR	ROW LA	λB			ANCHOR	AGE	LAB		
ANALYSES	1	CON	ITAINER	IS	ANALYSES	/	CONTA	AINE	RS		
		WATER		SOIL			WATER		SOIL		
TPH	1	1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz		
РСВ	1				SVOC (8270)		1 liter		8 oz		
PESTICIDES					TOTAL METALS		1 liter		8 oz		
HVOC 8010	1	1 x 40 ml		4 oz	DISS METALS		1 liter				
VOC-BTEX 8020 ✓ TDS 250 ml											
	TSS 250 ml										
	TOC 500 ml 4 oz										
					TCLP		2 liters		2 x 8 oz		
							,				

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; Ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: <u>08/24/93</u>		s	AMPLE !!	D: <u>LAY-SS</u> ()6-S02-1						
RADAR STATION: P	TE: 08/24/93 SAMPLE ID: LAY-SS06-S02-1 DAR STATION: Point Lay WEATHER: Partly cloudy, sunny, breezy, 45°F TE/AOC: Garage SS06 FEET FROM FIXED POINT: MAGNETIC HEADING:										
									NG:		
FIXED POINT: 25 fee											
SAMPLE MATRIX:	Soil (S)	☐ Sedime	ent (SD)		Surface Water (SW)		Groundwater	(GW)			
SAMPLERS: <u>JP, RC</u>	;										
TIME SAMPLED: 11	:25	D	EPTH OF	SAMPLE	(feet): <u>1</u>						
SAMPLE DESCRIPTION		NTS: <u>Undern</u>	eath gara	ige. Brown	to dark brown sandy	silt, lo	ose, slightly m	oist. S	ample taker		
mmediately above po											
SAMPLING METHOD											
QA/QC SAMPLES CO											
☐ Trip Blank (TB)		·			ID						
Ambient Conditio	n Blank (At	s) \square Replica	ate of So	II Sample IL) =	-3-					
			WA ⁻	TER PARAM	METERS						
TIME	PH	CON	NDUCTIV	ΊΤΥ	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY		
THILL											
			MON	TODING D	FADINGS			•			
			T	ITORING R				1			
TIME	PID READ	ING (ppm)	CG/LE	L (%)	HANBY SCREEN (standard/ppm)	IING					
11:23	700 in BH	, BG=0.5,									
	1.7 ppm i										
BG=Background;	BZ=Breath	ing Zone; BH	=Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncon	tained)		
					REQUESTED						
			ROW LA				ANCHO	RAGE	LAB		
			NTAINER		ANALYSES	1	CON	TAINE	RS		
ANALYSES	/	WATE		SOIL	ANACIOLO		WATER		SOIL		
			<u> </u>		V(OO (0000)		3 x 40 ml		4 oz		
TPH	/	1 liter		8 oz	VOC (8260)						
PCB	✓				SVOC (8270)		1 liter		8 oz		
PESTICIDES					TOTAL METALS		1 liter		8 oz		
HVOC 8010	1	1 x 40 ml		4 oz	DISS METALS		1 liter	<u> </u>			
VOC-BTEX 8020	1				TDS		250 mi				
					TSS		250 ml				
					тос		500 ml	т -	4 oz		
					TCLP		2 liters		2 x 8 oz		

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: <u>08/24/93</u>			_SAMPLE II	D: <u>LAY-SS</u>	06-S03-0.5				
RADAR STATION: P	oint Lay		WEATHER	t: Partly clo	oudy, sunny, breezy,	50°F			
SITE/AOC: Garage S	SS06		FEET FRO	M FIXED P	OINT: <u>20</u>	M	AGNETIC HEA	DING	: <u>98°</u>
FIXED POINT: South									
SAMPLE MATRIX:		☐ Sed	iment (SD)		Surface Water (SW)		Groundwater ((GW)	
SAMPLERS: <u>SS, RC</u> TIME SAMPLED: <u>1</u>			DEBTH OF	ECAMDIE	(fact): 0.0.5				· · · · · · · · · · · · · · · · · · ·
SAMPLE DESCRIPTION						mediu	m to coarse sa	nd. 40	-50% gravel
	J. 1, J. J. 1		,	-, <u>a,</u>					
SAMPLING METHOD):								
QA/QC SAMPLES C	OLLECTED:	•	•	• •					
☐ Trip Blank (TB)					ID				
☐ Ambient Condition	on Blank (Al	B) L Rep	licate of So	il Sample II)				
			WA:	TER PARAM	METERS				
TIME	PH	c	CONDUCTIV	'ITY	TEMPERATURE	SPE	CIFIC GRAVIT	ΥT	URBIDITY
						1			
BG=0.5			MON	ITORING R	EADINGS			- 1	
		WO (000	-1 (a/)	HANBY SCREEN	IING			
TIME		ING (ppm)	CG/LE	EL (%)	(standard/ppm)				
11:55	BG in BZ							-	
BG=Background;	BZ=Breath	ing Zone; E	3H=Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample (uncor	ntained)
			✓ CHECK	ANALYSES	S REQUESTED				
		E	BARROW LA	AB			ANCHO	RAGE	LAB
ANALYSES		(CONTAINER	RS	ANALYSES	/	CON	TAINE	RS
7			TER	SOIL			WATER		SOIL
TPH	1	1 liter		8 oz	VOC (8260)	1	3 x 40 ml		4 oz
РСВ	1				SVOC (8270)	1	1 liter		8 oz
PESTICIDES	1				TOTAL METALS	1	1 liter		8 oz
HVOC 8010		1 x 40 m	.	4 oz	DISS METALS	•	1 liter		
	/	1 × 40 111	'	4 02			250 ml	· · · · · · · · · · · · · · · · · · ·	
VOC-BTEX 8020	/				TDS				
					TSS		250 ml		4
					TOC		500 ml		4 oz
				ļ	TCLP	<u> </u>	2 liters		2 x 8 oz
							1		

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: 08/24/93 SAMPLE ID: <u>LAY-SS06-S04</u>										
RADAR STATION: <u>Po</u>	oint Lay		_WEATHER	: Partly clo	udy, breezy, 50°F					
SITE/AOC: <u>Garage S</u>									See below	
FIXED POINT: 36° to										
SAMPLE MATRIX:		☐ Sec	diment (SD)	□s	Surface Water (SW)		Groundwater ((GW)		
SAMPLERS: <u>SS, RC</u> TIME SAMPLED: <u>12</u>			DERTH OF	CAMPLE /	(foot):					
SAMPLE DESCRIPTION	ON/COMME	NTS: San	DEFTH OF ndv gravel, gr	ay brown, s	aturated, loose, 70%	grave	, 1/8-1/2 inch	gravel,	large gravel	
removed. Sample tak										
SAMPLING METHOD										
QA/QC SAMPLES CO	DLLECTED:	☐ Equ	uipment Blan	ık (EB)	☐ QA/QC Ext	ra Volu	ımes			
☐ Trip Blank (TB)					ID					
☐ Ambient Condition	n Blank (AE									
			WA	TER PARAM	METERS					
TIME	PH		CONDUCTIV	IΤΥ	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY	
BG=0.5			MON	ITORING RI	EADINGS					
BG=0.3			1			IING				
TIME	PID READ	ING (ppm) CG/LE	L (%)	HANBY SCREEN (standard/ppm)	iiNG				
	30 in BH,									
12:55	JU III BITI,	BG III BZ								
BG=Background;	BZ=Breath	ing Zone;	BH=Boreho	e; NR=No	Readings; HS=Hea	dspace	e; S=Sample ((uncor	itained)	
			✓ CHECK	ANALYSES	REQUESTED					
			BARROW LA	.B			ANCHO	RAGE	LAB	
ANALYSES			CONTAINER	S	ANALYSES	1	CON	TAINE	RS	
AIVALIGES			ATER	SOIL			WATER		SOIL	
TDL	1	1 liter	TO TO	8 oz	VOC (8260)		3 x 40 mi		4 oz	
PCB		i iitoi		0 02	SVOC (8270)		1 liter		8 oz	
	/				TOTAL METALS		1 liter		8 oz	
PESTICIDES		4 40		4 oz	DISS METALS		1 liter			
HVOC 8010	5010 TA 10 IIII									
VOC-BTEX 8020		<u> </u>			TDS					
					TSS		250 ml		4	
					TOC		500 ml		4 OZ	
					TCLP	ļ <u> </u>	2 liters		2 x 8 oz	

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Preservation:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: <u>08/24/93</u>			SA	MPLE II	D: <u>LAY-SS</u>	06-S05-1.5			*	
RADAR STATION: Point Lay WEATHER: Partly cloudy, breezy, 50°F										
SITE/AOC: <u>Garage S</u>	SS06		FE	ET FRO	M FIXED P	OINT:		MAGNETIC H	EADIN	G:
FIXED POINT: 42° to	northwest	corner c	of gara	ge, 61°	to southwe	est corner of garage	, 86° to	top of radom	ie.	
SAMPLE MATRIX:	• •	□s	edimer	nt (SD)		Surface Water (SW)		Groundwater	(GW)	
SAMPLERS: <u>SS, RC</u>										
TIME SAMPLED: 13						· · -				
SAMPLE DESCRIPTION	ON/COMME	ENTS: S	ame lo	cation a	s LAY-SS06	S-S06 (S05 is shallow	v). Cla	yey silt, gray, v	ery we	et, firm, trace
organics, peat. SAMPLING METHOD	: Hand au	ger								
QA/QC SAMPLES CO	-		auipm	ent Blar	nk (EB)	☐ QA/QC Ex	tra Volu	ımes		
						ID				
☐ Ambient Conditio										
				WA ⁻	TER PARAM	METERS			".1.	
TIME	PH		CONI	DUCTIV	TTY	TEMPERATURE	SPE	CIFIC GRAVIT	ΥT	URBIDITY
BG=0				MON	ITORING R	EADINGS				
BG=0			1	WON	ITONING N	<u> </u>				
TIME	PID READ	ING (pp	m)	CG/LE	EL (%)	HANBY SCREEN (standard/ppm)	IING			
13:10	22.8 in BI	l, BG in	BZ							
BG=Background;	BZ=Breath	ing Zone	 e; BH=	Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncor	ntained)
			C	HECK	ANALYSES	REQUESTED				
				ROW LA		l leader to		ANCHO	RAGE	ΙΔR
							_			
ANALYSES			CON	TAINER	S	ANALYSES	/	CON	TAINE	HS
		W	VATER		SOIL			WATER		SOIL
TPH	1	1 liter			8 oz	VOC (8260)		3 x 40 ml		4 oz
РСВ	1					SVOC (8270)		1 liter		8 oz
PESTICIDES						TOTAL METALS		1 liter		8 oz
HVOC 8010	1	1 x 40	ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1					TDS		250 ml		
						TSS		250 ml		
						тос		500 ml		4 oz
						TCLP		2 liters		2 x 8 oz
					į					

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: 08/24/93			SAN	APLE IC	: <u>LAY-SSC</u>	06-S06-2.5				
ADAR STATION: Point Lay WEATHER: Partly cloudy, breezy, 50°F FEAOC: Garage SS06 FEET FROM FIXED POINT: MAGNETIC HEADING:										
SITE/AOC: Garage S	S06		FEE	T FRO	M FIXED P	OINT:		MAGNETIC H	EADIN	G:
FIXED POINT: 42° to										
SAMPLE MATRIX: E SAMPLERS: <u>SS,</u> RC			diment	t (SD)	□s	Surface Water (SW)		Groundwater	(GW)	
TIME SAMPLED: 13	:15		DEF	TH OF	SAMPLE (feet): 2.5		(2002		
SAMPLE DESCRIPTION	ON/COMME	NTS: Sa	ame lo	cation a	s LAY-SSO	6-S05 (S06 is deep)	. Brow	vn silty peat, g	ıray, ve	ery wet
SAMPLING METHOD										
QA/QC SAMPLES CO										
						ID				
Ambient Conditio	n Blank (Ab) LI NE	plicate		ER PARAN					
	1	· · · · · · · · · · · · · · · · · · ·					005	OIFIO ODAVIT	, T	UDBIDITY
TIME	PH		COND	UCTIVI	TY	TEMPERATURE	SPE	CIFIC GRAVIT	<u> </u>	URBIDITY
BG=0.5				MON	TORING R				<u> </u>	
TU 45		INC (non	_,	CG/LE	1 /0/\	HANBY SCREEN (standard/ppm)	IING			
TIME	PID READ			CG/LE	L (76)	(Staridard/ppin)				
13:20	16 in BH,	0.5 in BZ	-						-	
	· · · · · · · · · · · · · · · · · · ·								l	
BG=Background;	BZ=Breath	ing Zone;	BH=E	Borehol	e; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncon	tained)
			CI	HECK A	NALYSES	REQUESTED				
			BARR	OW LA	В			ANCHO	RAGE	LAB
ANALYSES	1		CONT	TAINER	s	ANALYSES	1	CON	TAINE	RS
7.17.12.10.10	-	W	ATER		SOIL			WATER		SOIL
TPH	1	1 liter			8 oz	VOC (8260)		3 x 40 ml		4 oz
РСВ	1			ì		SVOC (8270)		1 liter		8 oz
PESTICIDES						TOTAL METALS		1 liter		8 oz
HVOC 8010	0 / 1 x 40 ml 4 oz DISS METALS 1 liter									
VOC-BTEX 8020	3020 ✓ TDS 250 ml									
						TSS		250 ml		
						тос		500 ml		4 oz
	TCLP 2 liters 2 x 8 oz									

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: <u>08/24/93</u>	ATE: 08/24/93 SAMPLE ID: <u>LAY-SS06-S07</u>									
	N: Point Lay WEATHER: Partly cloudy, breezy, 50°F									
SITE/AOC: Garage S	SS06		_ FEET I	FRO	M FIXED P	OINT:	MAGN	ETIC HEADING	3: <u>See</u>	below
FIXED POINT: 107°	to northeas	t corner of	main b	uildin	g train, 13	6° to top of radome	, 161°	to southeast o	orner	of garage.
SAMPLE MATRIX:	Soil (S)	☐ Sec	diment (S	SD)		Surface Water (SW)		Groundwater	(GW)	
SAMPLERS: JD										
TIME SAMPLED: 14	1:34		_ DEPTH	H OF	SAMPLE	(feet): <u>0.5</u>				
SAMPLE DESCRIPTION	ON/COMMI	ENTS: <u>Sat</u>	t and pe	pper	, gravelly, o	coarse sand at the t	op of t	ne water table.	<u>. </u>	
										
SAMPLING METHOD										
QA/QC SAMPLES CO	OLLECTED:									
☐ Trip Blank (TB)		•			•	ID		· · · · · · · · · · · · · · · · · · ·		
☐ Ambient Conditio	n Blank (Al	3) 🖪 Rep	olicate of	f Soil	Sample ID	LAY-SS06-S10				
				WAT	ER PARAN	METERS	,			
TIME	PH	(CONDUC	CTIVI	TY	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY
	· · · · · · · · · · · · · · · · · · ·									
	MONITORING READINGS									
						HANBY SCREEN	IING			
TIME	PID READ	ING (ppm) C(G/LE	L (%)	(standard/ppm)				
14:32	0.0									
BG=Background:	B7=Breath	ing Zone:	BH=Bor	rehol	e NR=No	Readings; HS=Hea	dspace	e: S=Sample ((uncor	tained)
Ba-Baokground,	DZ-Broati	g 20110,					ССРОО	, o – oup.o ,	(41.56.	
						REQUESTED				· · · ·
			BARROV	V LAI	B 			ANCHO	RAGE	LAB
ANALYSES	1	(CONTAI	NERS	3	ANALYSES	1	CON	TAINE	RS
		WA	TER		SOIL			WATER		SOIL
ТРН	1	1 liter		1	8 oz	VOC (8260)		3 x 40 ml		4 oz
PCB	1					SVOC (8270)		1 liter		8 oz
PESTICIDES						TOTAL METALS		1 liter		8 oz
HVOC 8010	✓ 1 x 40 ml 4 oz DISS METALS 1 liter									
VOC-BTEX 8020	DC-BTEX 8020 ✓ TDS 250 ml									
TSS 250 ml										
						тос		500 ml		4 oz
	TCLP 2 liters 2 x 8 oz									
	TCLP 2 liters 2 x 8 oz									

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>08/24/93</u>			_SAMPLE II	D: <u>LAY-SS</u>)6-S08						
	DAR STATION: Point Lay WEATHER: Partly cloudy, breezy, 55°F E/AOC: Garage SS06 FEET FROM FIXED POINT: MAGNETIC HEADING:										
							MAGNETIC	HEAD	NG:		
FIXED POINT: 175°											
SAMPLE MATRIX:	Soil (S)	☐ Sed	iment (SD)		Surface Water (SW)		Groundwater (GW)			
SAMPLERS:											
TIME SAMPLED: 15	5:05		_ DEPTH O	F SAMPLE	(feet): <u>0.3</u>						
SAMPLE DESCRIPTION	ON/COMME	ENTS: <u>Hea</u>	vily stained	, salt and p	epper, gravelly, coa	rse sar	ia with diesei-i	ike oo	or.		
SAMPLING METHOD	· Grab (so	000)									
QA/QC SAMPLES CO			inment Blar	rk (ER)	□ QA/QC Ex	ra Volu	ımes				
QA/QC SAMPLES CO ☐ Trip Blank (TB)	JLLEGIED.				ID						
☐ Ambient Conditio	n Blank (AF										
		1		TER PARAN		I					
TIME	PH	C	CONDUCTIV	'ITY	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY		
						İ					
			MON	ITORING R	EADINGS		****				
					HANBY SCREEN	IING					
TIME	PID READ	ING (ppm)	CG/LE	EL (%)	(standard/ppm)						
15:03	38										
BO B1	DZ Danash	ine 7000 [ZU_Borobo	lo: ND-No	Readings; HS=Hea	denace	s S-Sample (uncor	tained)		
BG=Background;	bZ=bream	ing zone, a	on=boreno	10, INN=140	neadings, 110-1100	азраос	3, 0—0ampio (0.100.			
			CHECK	ANALYSES	REQUESTED						
		В	BARROW LA	ΛB	!		ANCHO	RAGE	LAB		
ANALYSES		(CONTAINER	ns.	ANALYSES	1	CON	TAINE	RS		
ANALISES			TER	SOIL	, , , , , , , , , , , , , , , , , , , ,		WATER		SOIL		
			IEN	<u> </u>					4 oz		
TPH	1	1 liter		8 oz	VOC (8260)	1	3 x 40 mi				
PCB	1				SVOC (8270)	1	1 liter		8 oz		
PESTICIDES	1				TOTAL METALS	1	1 liter		8 oz		
HVOC 8010	010 / 1 x 40 ml 4 oz DISS METALS 1 liter										
VOC-BTEX 8020	BTEX 8020 ✓ TDS 250 mi										
					TSS		250 ml				
					тос		500 ml		4 oz		
	TCLP 2 liters 2 x 8 oz										
	ICLP Z IREIS Z X 0 0Z										

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: <u>08/24/93</u>		s	AMPLE II	D: <u>Lay-ss</u> (06-809-0.25						
RADAR STATION: Point Lay WEATHER: Partly cloudy, sunny, slight breeze, 45°F											
SITE/AOC: <u>Garage S</u>	SS06		FEET FF	ROM FIXED	POINT:	\	MAGNETIC HE	ADING	3:		
FIXED POINT: 25 fee	et due east	of west end o	f garage,	12 feet sou	th of north end of o	arage.					
SAMPLE MATRIX:	• •	☐ Sedim	ent (SD)		Surface Water (SW)		Groundwater	(GW)			
Samplers: <u>Jp, ro</u> Time Sampled: <u>11</u>		n	EDTU O	CAMPIE	(foot): 0.0.25						
SAMPLE DESCRIPTION						Brown	to dark brown	eand	v silt loose		
slightly moist.	O14/COIVIIVII	ENTO. Onder	ileatii ya	iage. Nepii	Cale 01 3300-301.	DIOWII	IO GAIN DIOWII	, Sanu	y 3iii, 10036,		
SAMPLING METHOD);										
QA/QC SAMPLES CO			nent Blar	nk (EB)	☐ QA/QC Ex	tra Volu	ımes				
☐ Trip Blank (TB)					ID						
☐ Ambient Conditio	n Blank (Al	•		•							
			WA	TER PARAN	METERS						
TIME	PH	cor	NDUCTIV	YTIY	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY		
BG=0.5			MON	ITORING R	EADINGS	.1					
			T		HANBY SCREEN	IING					
TIME	PID READ	ING (ppm)	CG/LE	EL (%)	(standard/ppm)	iii (G					
11:15	25 ppm ir	n BH									
	7.5 ppm i	n BZ									
BG=Background;	BZ=Breath	ing Zone; BH	=Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncor	ntained)		
			CHECK A	ANALYSES	REQUESTED						
		BAF	ROW LA	л В			ANCHO	RAGE	LAB		
ANALYSES		CO	NTAINER	IS	ANALYSES	1	CON	TAINE	RS		
		WATE	3	SOIL			WATER		SOIL		
ТРН	1	1 liter		8 oz	VOC (8260)		3 x 40 mi		4 oz		
РСВ	1				SVOC (8270)		1 liter		8 oz		
PESTICIDES					TOTAL METALS		1 liter		8 oz		
HVOC 8010	HVOC 8010										
VOC-BTEX 8020	1				TDS		250 ml				
					TSS		250 ml				
					тос		500 ml		4 oz		
					TCLP		2 liters		2 x 8 oz		

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; Ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

ADAR STATION: Point Lay WEATHER: Breezy, partly cloudy, 50°F SITE/AOC: Garage SS06	ATE: 08/24/93 SAMPLE ID: LAY-SS06-S10										
EXED POINT: 107° to northeast corner of main building train, 136° to top of radome, 161° to southeast corner of garage. SAMPLE MATRIX: Soil (S) Sediment (SD) Surface Water (SW) Groundwater (GW) SAMPLERS: JD IMME SAMPLED: 14:38 DEPTH OF SAMPLE (feet): 0.5 SAMPLED DESCRIPTION/COMMENTS: Salt and pepper gravelly coarse sand at the top of the water table. SAMPLING METHOD: Grab (bucket auger) CAYOC SAMPLES COLLECTED: Equipment Blank (EB) QAYOC Extra Volumes Trip Blank (TB) Duplicate of Water Sample ID LAY-SS06-S07 WATER PARAMETERS TIME PH CONDUCTIVITY TEMPERATURE SPECIFIC GRAVITY TURBIDITY MONITORING READINGS TIME PID READING (ppm) CG/LEL (%) HANBY SCREENING (standard/ppm) 14:36 0.0 HANBY SCREENING (standard/ppm) BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained) CHECK ANALYSES ANALYSES ANALYSES CONTAINERS ANALYSES ANALYSES ANALYSES CONTAINERS SOIL WATER SOIL WATER SOIL WATER SOIL WATER SOIL WATER SOIL WATER SOIL WATER SOIL	RADAR STATION: P	N: Point Lay WEATHER: Breezy, partly cloudy, 50°F									
SAMPLE MATRIX: Soil (S) Sediment (SD) Surface Water (SW) Groundwater (GW) SAMPLERS: JD IME SAMPLED: 14:38 DEPTH OF SAMPLE (feet): 0.5 SAMPLE DESCRIPTION/COMMENTS: Sait and pepper gravelly coarse sand at the top of the water table. SAMPLING METHOD: Grab (bucket auger) CA/CC SAMPLES COLLECTED: Equipment Blank (EB) QA/CC Extra Volumes Trip Blank (TB) Duplicate of Water Sample ID Ambient Condition Blank (AB) Replicate of Soil Sample ID WATER PARAMETERS TIME PH CONDUCTIVITY TEMPERATURE SPECIFIC GRAVITY TURBIDITY MONITORING READINGS TIME PID READING (ppm) CG/LEL (%) (standard/ppm) BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained) CHECK ANALYSES ANALYSES CONTAINERS WATER SOIL WATER SOIL WATER SOIL	SITE/AOC: <u>Garage (</u>	SS06		FEE	ET FRO	OM FIXED	POINT:	^	MAGNETIC HE	ADINO	3:
DEPTH OF SAMPLE (feet): 0.5 SAMPLED: 14:38 DEPTH OF SAMPLE (feet): 0.5 SAMPLED DESCRIPTION/COMMENTS: Saft and pepper gravelly coarse sand at the top of the water table. SAMPLING METHOD: Grab (bucket auger) DA/CC SAMPLES COLLECTED:	FIXED POINT: 107°	to northeas	t corner o	of main I	buildin	g train, 13	6° to top of radome	, 161°	to southeast	corner	of garage.
DEPTH OF SAMPLED: 14:38 DEPTH OF SAMPLE (feet): 0.5 SAMPLED DESCRIPTION/COMMENTS: Salt and pepper gravelly coarse sand at the top of the water table. SAMPLING METHOD: Grab (bucket auger) DA/OC SAMPLES COLLECTED:	SAMPLE MATRIX:	Soil (S)	☐ Se	diment	(SD)		Surface Water (SW)		Groundwater	(GW)	
SAMPLING METHOD: Grab (bucket auger) CA/QC SAMPLES COLLECTED:	SAMPLERS: JD										
SAMPLING METHOD: Grab (bucket auger) DA/QC SAMPLES COLLECTED:											
QA/QC SAMPLES COLLECTED:	SAMPLE DESCRIPTI	ON/COMMI	ENTS: <u>Sa</u>	alt and p	epper	gravelly c	oarse sand at the to	p of th	e water table.		
QA/QC SAMPLES COLLECTED:	CAMPLING METHOE	Crab (b)	icket auge) rl							
Trip Blank (TB) Duplicate of Water Sample ID Ambient Condition Blank (AB) Replicate of Soil Sample ID WATER PARAMETERS TIME PH CONDUCTIVITY TEMPERATURE SPECIFIC GRAVITY TURBIDITY MONITORING READINGS TIME PID READING (ppm) CG/LEL (%) HANBY SCREENING (standard/ppm) 14:36 0.0 BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained) CHECK ANALYSES REQUESTED ANALYSES V CONTAINERS ANALYSES V CONTAINERS WATER SOIL WATER SOIL WATER SOIL					t Riani	(ER)	□ OA/OC Ex	tra Voli	ımes		
Ambient Condition Blank (AB) Replicate of Soil Sample ID LAY-SS06-S07 WATER PARAMETERS TIME PH CONDUCTIVITY TEMPERATURE SPECIFIC GRAVITY TURBIDITY MONITORING READINGS TIME PID READING (ppm) CG/LEL (%) HANBY SCREENING (standard/ppm) 14:36 0.0 HANBY SCREENING (standard/ppm) BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained) CHECK ANALYSES REQUESTED BARROW LAB ANALYSES ANALYSES CONTAINERS ANALYSES WATER SOIL WATER SOIL								iia voit	211103		
TIME				•		•					
TIME											
MONITORING READINGS TIME PID READING (ppm) CG/LEL (%) HANBY SCREENING (standard/ppm) 14:36 0.0 BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained) CHECK ANALYSES REQUESTED BARROW LAB ANALYSES CONTAINERS ANALYSES WATER SOIL WATER SOIL		1						1		[_	
TIME PID READING (ppm) CG/LEL (%) HANBY SCREENING (standard/ppm) 14:36 0.0 BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained) CHECK ANALYSES REQUESTED BARROW LAB ANCHORAGE LAB CONTAINERS ANALYSES CONTAINERS WATER SOIL WATER SOIL	TIME	PH		CONDL	JCTIVI	ΓΥ	TEMPERATURE	SPE	CIFIC GRAVIT	Y 1	URBIDITY
TIME PID READING (ppm) CG/LEL (%) HANBY SCREENING (standard/ppm) 14:36 0.0 BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained) CHECK ANALYSES REQUESTED BARROW LAB ANCHORAGE LAB CONTAINERS ANALYSES CONTAINERS WATER SOIL WATER SOIL											
TIME PID READING (ppm) CG/LEL (%) HANBY SCREENING (standard/ppm) 14:36 0.0 BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained) CHECK ANALYSES REQUESTED BARROW LAB ANCHORAGE LAB CONTAINERS ANALYSES CONTAINERS WATER SOIL WATER SOIL											
TIME PID READING (ppm) CG/LEL (%) HANBY SCREENING (standard/ppm) 14:36 0.0 BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained) CHECK ANALYSES REQUESTED BARROW LAB ANCHORAGE LAB CONTAINERS ANALYSES CONTAINERS WATER SOIL WATER SOIL											
TIME PID READING (ppm) CG/LEL (%) HANBY SCREENING (standard/ppm) 14:36 0.0 BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained) CHECK ANALYSES REQUESTED BARROW LAB ANCHORAGE LAB CONTAINERS ANALYSES CONTAINERS WATER SOIL WATER SOIL			<u>-</u>								
TIME PID READING (ppm) CG/LEL (%) (standard/ppm) 14:36 0.0 BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained) CHECK ANALYSES REQUESTED BARROW LAB ANALYSES OONTAINERS ANALYSES OONTAINERS WATER SOIL WATER SOIL					MONI	TORING R	EADINGS				
14:36 0.0 BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained) CHECK ANALYSES REQUESTED BARROW LAB ANALYSES CONTAINERS ANALYSES WATER SOIL WATER SOIL							HANBY SCREEN	IING			
BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained) CHECK ANALYSES REQUESTED BARROW LAB ANALYSES CONTAINERS ANALYSES OCONTAINERS WATER SOIL WATER SOIL	TIME	PID READ	ING (ppm	n) C	CG/LEL	_ (%)	(standard/ppm)			_ _	
CHECK ANALYSES REQUESTED BARROW LAB ANALYSES CONTAINERS ANALYSES ONTAINERS WATER SOIL ANCHORAGE LAB CONTAINERS WATER SOIL ANALYSES VOIL	14:36	0.0									
CHECK ANALYSES REQUESTED BARROW LAB ANALYSES CONTAINERS ANALYSES ONTAINERS WATER SOIL ANCHORAGE LAB CONTAINERS WATER SOIL ANALYSES VOIL											
CHECK ANALYSES REQUESTED BARROW LAB ANALYSES CONTAINERS ANALYSES ONTAINERS WATER SOIL ANCHORAGE LAB CONTAINERS WATER SOIL ANALYSES VOIL	BG=Background:	BZ=Breath	ina Zone:	BH=Bc	orehole	: NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncor	ntained)
BARROW LAB CONTAINERS ANALYSES ANALYSES ANALYSES ANALYSES WATER SOIL ANCHORAGE LAB CONTAINERS WATER SOIL			,					•			
ANALYSES CONTAINERS ANALYSES CONTAINERS WATER SOIL WATER SOIL				CHE	ECK A	NALYSES	REQUESTED	-			
WATER SOIL WATER SOIL				BARRO	W LAE	3			ANCHO	PRAGE	LAB
WATER SOIL WATER SOIL	ANALYSES	1		CONTA	NERS	;	ANALYSES	1	CON	TAINE	RS
			WA	ATER		SOIL			WATER		SOIL
	TPH					8 oz	VOC (8260)		3 x 40 ml		4 oz
PCB SVOC (8270) 1 liter 8 oz					į				1 liter		8 oz
PESTICIDES TOTAL METALS 1 liter 8 oz							· · · · · · · · · · · · · · · · · · ·			-	8 oz
HVOC 8010 ✓ 1 x 40 ml											
VOC-BTEX 8020 ✓ TDS 250 ml	VOC-BTEX 8020 ✓ TDS 250 ml										
TSS 250 ml							TSS		250 ml		
TOC 500 ml 4 oz							тос		500 ml		4 oz
TCLP 2 liters 2 x 8 oz							TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; Ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: <u>08/24/93</u>			SA	MPLE !	D: <u>LAY-SS</u>	06-S11-0.5				
RADAR STATION: Point Lay WEATHER: Breezy, partly cloudy, 50°F SITE/AOC: Garage SS06 FEET FROM FIXED POINT: MAGNETIC HEADING:										
										à:
FIXED POINT: 359°	to southeas	t corner	of gar	age, 342	2° to northe	east corner of garag	e, 96°	to top of rador	ne.	
SAMPLE MATRIX:	Soil (S)	☐ Se	edime	nt (SD)		Surface Water (SW)		Groundwater (GW)	
SAMPLERS: <u>SS, RC</u>		_								
TIME SAMPLED: 15								1/0 1/0 :		
SAMPLE DESCRIPTION	ON/COMME	NIS: GI	ravelly	sand, g	ray-dark gr	ay, very wet, sneen,	gravei	1/8-1/2 Inch, co	oarse :	o tine sano.
SAMPLING METHOD);									
QA/QC SAMPLES C		□ E	quipm	ent Blan	nk (EB)	☐ QA/QC Ext	ra Volu	ımes		
						ID				
☐ Ambient Conditio	n Blank (AE	3) 🗆 R	eplicat	e of Soi	il Sample I)				
				WA ⁻	TER PARAM	METERS				
TIME	PH		CON	DUCTIV	ΊΤΥ	TEMPERATURE	SPE	CIFIC GRAVIT	ΥT	URBIDITY
BG=0.5				MON	ITORING R	EADINGS				
						HANBY SCREEN	IING			
TIME	PID READ	ING (ppr	m)	CG/LE	L (%)	(standard/ppm)				
	NR									
			i							
BG=Background;	BZ=Breath	ing Zone	; BH=	Boreho	le; NR=No	Readings; HS=Hea	dspac	e; S=Sample (uncor	itained)
	·		C	HECK /	ANALYSES	REQUESTED				
			BARF	ROW LA	.В			ANCHO	RAGE	LAB
ANALYSES			CON	TAINER	S	ANALYSES	1	CON	TAINE	RS
7110121020		w	/ATER		SOIL	,,,,,	•	WATER		SOIL
ТРН	1	1 liter			8 oz	VOC (8260)		3 x 40 mi		4 oz
РСВ	1					SVOC (8270)		1 liter		8 oz
PESTICIDES	<u> </u>					TOTAL METALS		1 liter		8 oz
									wa wa da	
VOC-BTEX 8020	1	1 7 10	•••			TDS		250 ml		
	 			.i		TSS		250 ml		
						тос		500 ml		4 oz
						TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCI to pH <2; metals: HNO_3 to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

****		s									
ADAR STATION: Point Lay WEATHER: Overcast, windy, 32°F ITE/AOC: Garage SS06 FEET FROM FIXED POINT: MAGNETIC HEADING:											
								EADIN	NG:		
IXED POINT: 143°											
SAMPLE MATRIX:		☐ Sedim	ent (SD)		Surface Water (SW)		Groundwater (GW)			
SAMPLERS: <u>JP, SF</u>											
TIME SAMPLED: 15						10 +0 21	4 inch gravel				
SAMPLE DESCRIPTION	ON/COMMI	=NIS: <u>Wet, s</u>	angy gra	ivei, mealui	m to coarse sand, 1/	6 (O 3/	4 IIICH GIAVEI.				
SAMPLING METHOD). Hand au	ner									
QA/QC SAMPLES CO			nont Ria	nk (ER)	□ OA/OC Ex	tra Voli	ımes				
☐ Trip Blank (TB)	OLLEGIED.				9 ID						
☐ Ambient Conditio	n Blank (Af	•		•							
	(***	- Tropile									
			WA	TER PARA	1			T			
TIME	PH	CO	NDUCTIV	/ITY	TEMPERATURE	SPE	CIFIC GRAVITY	<u> </u>	URBIDITY		
								\top			
			MON	IITORING F	READINGS						
HANBY SCREENING											
TIME	PID READ	ING (ppm)	CG/LE	EL (%)	(standard/ppm)			-			
DO 0-1	D7 D	ina Zamai BU	Porcho	No. ND-No	Readings; HS=Hea	denac	s S-Sample (i	incor	rtained)		
BG=Background;	BZ=Breatn	ing Zone; BH	=B0lell0	ile, INN=INC	neadings, 113—11ec	adspac	s, o-campic (311001	itairioa)		
			CHECK	ANALYSES	REQUESTED						
		BAF	RROW LA	∖ B			ANCHO	RAGE	LAB		
	_	60	NTAINEF		ANIALVOEC	,	CONT	AINE	RS		
ANALYSES				1	ANALYSES	1		7 (1) (1			
		WATE	R	SOIL	ļ <u> </u>		WATER		SOIL		
TPH		1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz		
РСВ					SVOC (8270)		1 liter		8 oz		
PESTICIDES					TOTAL METALS		1 liter		8 oz		
HVOC 8010		1 x 40 ml		4 oz	DISS METALS		1 liter				
1 11 11 11 11 11 11 11 11 11 11 11 11 1											
VOS 512X 5025											
VPH ✓ TSS 250 ml											
EPH	1				TOC		500 ml		4 oz		
					TCLP		2 liters		2 x 8 oz		
		<u> </u>		<u> </u>							

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>09/07/93</u>			SAM	APLE I	D: <u>Lay-ss</u> ()6-2S135				
RADAR STATION: Point Lay WEATHER: Overcast, windy, 32°F										
SITE/AOC: <u>Garage S</u>	SS06		F	EET F	ROM FIXED	POINT:		MAGNETIC H	EADIN	IG:
FIXED POINT: 76° to	northeast	corner of	garage	e, 125°	to northwe	st corner of garage	228° 1	o north POL t	ank.	
SAMPLE MATRIX:	Soil (S)	☐ Se	ediment	t (SD)		Surface Water (SW)		Groundwater ((GW)	
SAMPLERS: <u>SS, SF</u>										
TIME SAMPLED: 15										
SAMPLE DESCRIPTION	ON/COMME	ENTS: <u>Ta</u>	ken at	interfac	ce of brown	n peat and gray, cla	yey silt	moist.		
SAMPLING METHOD	· Hand au	ner								
QA/QC SAMPLES CO			ruiome	nt Blan	k (FB)	☐ QA/QC Ext	ra Volu	ımes		
☐ Trip Blank (TB)	JEEE 0 1 E.D.					ID				
☐ Ambient Condition	n Blank (AE									
		.		WAT	TER PARAN	METERS				
TIME	Tau	T	COND		····		enr	CILIC CDAVIT	<u> </u>	URBIDITY
TIME	PH		COND	OCTIV	II Y	TEMPERATURE	SPE	CIFIC GRAVIT	1	ווטוסחט
							ļ		_ _	
	MONITORING READINGS									
						HANBY SCREEN	IING		<u> </u>	
TIME	PID READ	ING (ppn	n)	CG/LE	L (%)	(standard/ppm)	iiivG			
				<u> </u>						
BG=Background;	BZ=Breath	ing Zone;	BH=B	Borehol	e; NR=No	Readings; HS=Hea	dspace	e; S=Sample (uncor	tained)
			CH	HECK A	NALYSES	REQUESTED				
			BARRO	OW LA	В			ANCHO	RAGE	LAB
ANIALVOTO			CONT	AINER	<u> </u>	ANALYSES		CON	TAINE	RS.
ANALYSES				AINEI		ANALISES	/		.,	
			ATER	İ	SOIL			WATER		SOIL
TPH		1 liter			8 oz	VOC (8260)		3 x 40 ml		4 oz
PCB						SVOC (8270)		1 liter		8 oz
PESTICIDES						TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40 r	ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	VOC-BTEX 8020 ✓ TDS 250 ml									
VPH	1					TSS		250 ml		
EPH	1					тос		500 ml		4 oz
						TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC; HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; ice all samples to $\mathrm{4^{\circ}C}$

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>09/07/93</u>												
MADAR STATION: Point Lay WEATHER: Overcast, windy, drizzle, 32°F ITE/AOC: Garage SS06 FEET FROM FIXED POINT: MAGNETIC HEADING:												
SITE/AOC: <u>Garage S</u>	S06			FEET FI	ROM FIXED	POINT:		MAGNETIC H	EADIN	IG:		
IXED POINT: South	west of gar											
SAMPLE MATRIX: SAMPLERS: SS, RC	• •	□s	edimer	nt (SD)		Surface Water (SW)		Groundwater ((GW)			
TIME SAMPLED: 15		***	DE	PTH OF	SAMPLE	(feet): 4.5						
SAMPLE DESCRIPTION							1 inch	n gravel.				
SAMPLING METHOD	: Hand aug											
QA/QC SAMPLES CO	OLLECTED:		quipm	ent Blan	k (EB)	☐ QA/QC Ext	ra Volu	ımes				
☐ Trip Blank (TB)			-			ID						
☐ Ambient Condition	n Blank (AE	3) 🗆 F	Replicat	e of Soi	I Sample I)						
				WA	TER PARAM	METERS						
TIME	PH		CON	DUCTIV	ITY	TEMPERATURE	SPE	CIFIC GRAVIT	y T	URBIDITY		
THAC	1											
	MONITORING READINGS											
MONITORING READINGS HANBY SCREENING												
TIME	PID READ	ING (pp	om)	CG/LE	L (%)	(standard/ppm)						
BG=Background:	BZ=Breath	ina Zone	I e: BH=	Boreho	e; NR=No	Readings; HS=Hea	dspace	e; S=Sample ((uncor	tained)		
		<u> </u>				REQUESTED						
	T			ROW LA		TIEGOZOTES		ANCHO	RAGE	LAB		
							!		·			
ANALYSES	1		CON	ITAINER	S	ANALYSES	1	CON	TAINE	HS		
		V	WATER	l	SOIL			WATER		SOIL		
ТРН		1 liter			8 oz	VOC (8260)		3 x 40 ml		4 oz		
РСВ						SVOC (8270)		1 liter		8 oz		
PESTICIDES						TOTAL METALS		1 liter		8 oz		
HVOC 8010		1 x 40	ml		4 oz	DISS METALS		1 liter				
VOC-BTEX 8020	1			<u> </u>		TDS		250 ml				
VPH	1					TSS		250 ml				
EPH	1					TOC		500 ml		4 oz		
						TCLP		2 liters		2 x 8 oz		

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: <u>09/07/93</u>			SAMPLE	ID: <u>LAY-SS</u>	06-2S15-4					
RADAR STATION: Point Lay WEATHER: Overcast, windy, drizzle, 35°F										
SITE/AOC: Garage S	S06		FEET	FROM FIXE	POINT:		MAGNETIC H	IEADIN	IG:	
FIXED POINT: South	of garage,	10 feet ea	ast of west	end, 46 feet	south of south end.					
SAMPLE MATRIX:	• •	☐ Se	diment (SE)) 🗆 s	Surface Water (SW)		Groundwater	(GW)		
SAMPLERS: <u>SS, JP</u> TIME SAMPLED: <u>15</u>			DEDTU	OF CAMPLE	/fact): A					
SAMPLE DESCRIPTION						oareo e	and			
SAMPLE DESCRIPTION	JIN/OOIVIIVIE	1413. <u>Un</u>	avelly Sail	<u>1, 1/4 to 1.5 ii</u>	ich graver, inte to co	Jai 30 3	aria.			
SAMPLING METHOD	: Hand au	ger								
QA/QC SAMPLES CO	DLLECTED:				☐ QA/QC Ex					
☐ Trip Blank (TB)		☐ Du	plicate of \	Vater Sample	ID					
☐ Ambient Condition	n Blank (AE	3) 🗆 Re	plicate of S	Soil Sample II						
		·	W	ATER PARA	METERS	<u>, </u>				
TIME	PH		CONDUCT	TVITY	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY	
	MONITORING READINGS									
			IVIC	INII ONING H	<u> </u>					
TIME	PID READ	ING (ppm	n) CG/	LEL (%)	HANBY SCREEN (standard/ppm)	iing				
		(, , , , ,	(\-,						
DC Bookeround	B7 - Brooth	ina Zono:	PU-Porol	nolo: NB-No	Readings; HS=Hea	denace	o: S-Sample	(uncor	tained)	
BG=Background;	DZ=Dream	ing zone,	DU=D016	IOIB, INN=INO	neadings, HS=Hea	iuspace	s, S=Sample	(uncor	itali led)	
			CHEC	K ANALYSES	REQUESTED					
			BARROW	LAB			ANCHO	RAGE	LAB	
ANALYSES	1		CONTAIN	ERS	ANALYSES	1	CON	TAINE	RS	
		W	ATER	SOIL			WATER		SOIL	
TPH		1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz	
РСВ					SVOC (8270)		1 liter		8 oz	
PESTICIDES					TOTAL METALS		1 liter		8 oz	
HVOC 8010	HVOC 8010 1 x 40 ml 4 oz DISS METALS 1 liter									
VOC-BTEX 8020	1				TDS		250 ml			
VPH	1				TSS		250 ml			
EPH	1				тос		500 ml		4 oz	
					TCLP		2 liters		2 x 8 oz	

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>09/07/93</u>			_SAMPLE	ID: <u>LAY-SS</u>	06-2S16						
RADAR STATION: Po	Point Lay WEATHER: Overcast, windy, drizzle, 35°F SS06 FEET FROM FIXED POINT: MAGNETIC HEADING:										
SITE/AOC: Garage S	S06		_FEET FR	OM FIXED P	OINT:	_ MA	GNETIC HEAD	DING: _			
FIXED POINT: South	west of gar	age, 15 fee	et west of v	vest side, 67	feet south of south	end, b	etween fuel ta	nks.			
SAMPLE MATRIX:	Soil (S)	☐ Sed	liment (SD)		Surface Water (SW)		Groundwater	(GW)			
SAMPLERS: <u>JP</u> TIME SAMPLED: <u>15</u>	.50		DEDTU C	CAMPLE	(fact): F						
SAMPLE DESCRIPTION						ch grav	el				
SAMPLE DESCRIPTION	JIN/OCIVIIVIE	.N13. <u>Gia</u>	ivelly salid,	mie to coar	30 3ano, 174 to 1 m	on giar	<u> </u>				
SAMPLING METHOD											
QA/QC SAMPLES CO	DLLECTED:										
☐ Trip Blank (TB)					ID						
☐ Ambient Condition	n Blank (AE	B) 🗌 Rep	olicate of S	oil Sample II)						
			W	ATER PARAM	METERS						
TIME	PH		CONDUCTI	VITY	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY		
	-					_		_			
	MONITORING READINGS										
	HANBY SCREENING										
TIME	PID READ	ING (ppm)) CG/L	EL (%)	(standard/ppm)						
							i				
BG=Background;	BZ=Breath	ing Zone; I	BH=Boreh	ole; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncon	tained)		
					REQUESTED						
		E	BARROW L	AB			ANCHO	RAGE	LAB		
ANALYSES	1	(CONTAINE	RS	ANALYSES	1	CON	TAINE	RS		
		WA	TER	SOIL			WATER		SOIL		
трн		1 liter		8 oz	VOC (8260)	1	3 x 40 ml		4 oz		
РСВ					SVOC (8270)	1	1 liter		8 oz		
PESTICIDES					TOTAL METALS	,	1 liter		8 oz		
HVOC 8010	C 8010 1 x 40 ml 4 oz DISS METALS 1 liter										
VOC-BTEX 8020	1				TDS		250 ml				
VPH	1				TSS		250 ml				
EPH	1				тос		500 ml		4 oz		
					TCLP		2 liters		2 x 8 oz		
					ļ						

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: <u>09/07/93</u>		SA	MPLE I	D: <u>LAY-SS</u> 0	6-2S18					
RADAR STATION: Point Lay WEATHER: Overcast, windy, drizzle, 35°F										
SITE/AOC: Garage S	S06	F	EET FR	OM FIXED	POINT:	M	IAGNETIC HE	ADING	i:	
FIXED POINT: South	west of gar	age, 15 feet w	est of we	est side, 67	feet south of south	end, b	etween fuel tar	nks.		
SAMPLE MATRIX:	Soil (S)	☐ Sedime	nt (SD)	□s	urface Water (SW)		Groundwater ((GW)		
SAMPLERS: <u>JP</u>										
TIME SAMPLED: 15								· · · · · · · · · · · · · · · · · · ·		
SAMPLE DESCRIPTION	ON/COMME	NTS: Gravell	/ sand, f	ine to coars	se sand, 1/4 to 1 inc	h grav	el			
SAMPLING METHOD	. Hand au	30r								
QA/QC SAMPLES CO			ent Blan	k (FB)	□ OA/OC Ext	ra Volu	ımes			
☐ Trip Blank (TB)	OLLLOTED.				ID LAY-SS06-2S16					
☐ Ambient Conditio		•		•						
				TER PARAM						
	1			-		005	01510 ODAN (IT	, ,	UDDIDITY	
TIME	PH	CON	DUCTIV	ITY	TEMPERATURE	SPE	CIFIC GRAVIT	<u> </u>	URBIDITY	
						ļ		_		
			MON	TODINO DI	FARINGS					
			MON	ITORING RI	T			<u> </u>		
TIME PID READING (ppm) CG/LEL (%) (standard/ppm)										
THVIC	TID TIEAD	пта (ррпп)	OGILL	(/0/	(otanoara/ppm)					
			ļ					<u> </u>		
BG=Background;	BZ=Breath	ing Zone; BH=	Boreho	ie; NR=No	Readings; HS=Hea	dspace	e; S=Sample (uncon	tained)	
		(CHECK /	ANALYSES	REQUESTED					
		BAD	ROW LA	R			ANCHO	RAGE	LAB	
ANALYSES	1	CON	ITAINER	S	ANALYSES	/	CON	TAINE	HS	
		WATER	}	SOIL			WATER		SOIL	
TPH		1 liter		8 oz	VOC (8260)	1	3 x 40 ml		4 oz	
PCB					SVOC (8270)	>	1 liter		8 oz	
PESTICIDES					TOTAL METALS		1 liter		8 oz	
HVOC 8010		1 x 40 ml		4 oz	DISS METALS		1 liter			
VOC-BTEX 8020 ✓ TDS 250 ml										
VPH	1	·			TSS		250 ml			
EPH	1				тос		500 ml		4 oz	
					TCLP		2 liters		2 x 8 oz	

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>09/07/93</u>			SA	MPLE II	D: <u>Lay-ss</u>	06-2SD05						
RADAR STATION: P	oint Lay		WE	EATHER	: Overcast	, windy, 32°F						
SITE/AOC: <u>Garage S</u>												
FIXED POINT: 121°	to northeas	t corner	of gara	age, 173	e to northy	vest corner of garag	e, 227.	5° to north PC	L tank	<u>. </u>		
SAMPLE MATRIX:	` '			nt (SD)		Surface Water (SW)		Groundwater	(GW)			
SAMPLERS: <u>JP, RC</u> TIME SAMPLED: <u>15</u>	, :·15		DE	PTH OF	SAMPLE	(feet):						
SAMPLE DESCRIPTION												
SAMPLING METHOD	: Grab											
QA/QC SAMPLES CO			quipm	ent Blar	nk (EB)	☐ QA/QC Ex	tra Volu	ımes				
☐ Trip Blank (TB)						ID						
	Ambient Condition Blank (AB)											
WATER PARAMETERS												
TIME	PH		CON	DUCTIV	ITY	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY		
MONITORING READINGS												
						HANBY SCREEN	IING					
TIME	PID READ	ING (pp)m)	CG/LE	:L (%)	(standard/ppm)			+			
									+			
PGBackground:	R7—Breath	ing Zone		Boreho	le: NR=No	Readings; HS=Hea	dspace	: S=Sample	l_ (uncor	tained)		
BG=Background,	DZ-DICALII	ing Zone				S REQUESTED						
				ROW LA		REGOESTED		ANCHO	RAGE	LAB		
				TAINER		ANALYSES	1		TAINE			
ANALYSES	1	1/	VATER		SOIL	ANALISES		WATER		SOIL		
TOU		1 liter	VAIEN		8 oz	VOC (8260)		3 x 40 ml		4 oz		
PCB		i III.			0 02	SVOC (8270)		1 liter		8 oz		
PESTICIDES						TOTAL METALS		1 liter		8 oz		
HVOC 8010		1 x 40	ml	T	4 oz	DISS METALS		1 liter				
VOC-BTEX 8020	1					TDS		250 ml				
VPH	1					TSS		250 ml				
EPH	1					тос		500 ml		4 oz		
						TCLP		2 liters		2 x 8 oz		

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; Ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: <u>09/07/93</u>	· · · · · · · · · · · · · · · · · · ·		SA	MPLE I	D: <u>LAY-SS</u>	06-2SD06				
RADAR STATION: P										
SITE/AOC: <u>Garage S</u>								MAGNETIC HE	ADING	} :
FIXED POINT: 181°									·	
SAMPLE MATRIX:	Soil (S)	■ Se	edimer	nt (SD)		Surface Water (SW)		Groundwater ((GW)	
SAMPLERS: <u>JP</u>										
TIME SAMPLED: 15										
SAMPLE DESCRIPTION	ON/COMM	ENTS: S	aturate	ed, grav	elly sand, n	nedium to coarse sa	ina, 1/4	to 1.5 inch gi	avei.	
SAMPLING METHOD): Grab									
QA/QC SAMPLES C	OLLECTED:	□ E	quipm	ent Blar	nk (EB)	☐ QA/QC Ex	tra Volu	ımes		
						ID				
☐ Ambient Conditio	n Blank (AE	3) 🗆 R	eplicat	e of So	il Sample II)				
				WA ⁻	TER PARAM	METERS	-			
TIME	PH	,	CON	DUCTIV	ΊΤΥ	TEMPERATURE SPECIFIC GRAVITY TL			URBIDITY	
				MON	ITORING R	EADINGS		T		
TIME DID READING (1.1.1)						HANBY SCREEN	IING		İ	
TIME	PID READ	ING (ppr	m)	CG/LE	:L (%)	(standard/ppm)				
									_ _	
BG=Background;	BZ=Breath	ing Zone	; BH=	Boreho	le; NR=No	Readings; HS=Hea	dspac	e; S=Sample (uncor	ntained)
			1	CHECK	ANALYSES	S REQUESTED				
			BARF	ROW LA	\B			ANCHO	RAGE	LAB
ANALYSES			CON	TAINER	ıs	ANALYSES	1	CON	TAINE	RS
		W	/ATER		SOIL			WATER		SOIL
TPH		1 liter			8 oz	VOC (8260)	1	3 x 40 ml		4 oz
РСВ						SVOC (8270)	1	1 liter		8 oz
PESTICIDES						TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40	ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	VOC-BTEX 80020					TDS		250 ml		
VPH 🗸						TSS		250 ml		
EPH	1					тос		500 ml		4 oz
						TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO_3 to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>09/07/93</u>			SA	MPLE II	D: LAY-SS	06-2SD07				
RADAR STATION: P	oint Lay		WE	EATHER	: Overcast	, windy, drizzle, 32°	<u> </u>			
SITE/AOC: <u>Garage S</u>	SS06		F	EET FF	ROM FIXED	POINT:	١	MAGNETIC HE	ADINO] :
FIXED POINT: 135.5										
SAMPLE MATRIX:	Soil (S)		edime	nt (SD)		Surface Water (SW)		Groundwater	(GW)	
SAMPLERS: JP										
TIME SAMPLED: 15	5:35		DE	PTH O	SAMPLE	(feet):				
SAMPLE DESCRIPTION	ON/COMMI	ents: <u>s</u>	Saturate	ed, grav	elly sand, fi	ne to coarse sand,	1/4 to	1.5 inch grave	l	
04450 100 4571 100	0									
SAMPLING METHOD			!	ant Diam		□ 04/00 Ev	tra Vali	ımos		
QA/QC SAMPLES CO	DLLECTED:					ID				
☐ Trip Blank (TB)☐ Ambient Conditio										
Ambient Conditio	וו טומווא (אנ	<i>,</i> (icpiioa.			<u> </u>				
				WA	TER PARAM	METERS	T			
TIME	PH		CON	DUCTIV	ΊΤΥ	TEMPERATURE	SPE	CIFIC GRAVIT	Υ Τ	URBIDITY
-										
				MON	ITORING R	EADINGS				
HANBY SCREENING										
TIME	PID READING (ppm)				L (%)	(standard/ppm)	41140			
									_	
BG=Background;	BZ=Breath	ing Zone	e; BH=	Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncor	ntained)
			/	CHECK	ANALYSES	REQUESTED				
			DADE	ROW LA	D			ANCHO	DRAGE	LAR
	i									
ANALYSES	1		CON	TAINER	S	ANALYSES	1	CON	TAINE	RS
		v	VATER		SOIL			WATER		SOIL
TPH		1 liter			8 oz	VOC (8260)		3 x 40 ml		4 oz
РСВ						SVOC (8270)		1 liter		8 oz
PESTICIDES						TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40	ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1					TDS		250 ml		
VPH	✓ TSS 250					250 ml				
EPH	1				тос		500 ml		4 oz	
						TCLP		2 liters		2 x 8 oz
II										

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: <u>08/24/93</u>		SA	MPLE I	D: <u>LAY-SS</u> (6-SD01					
RADAR STATION: P	oint Lay	w	EATHER	: Partly clo	udy, breezy, 50°F					
SITE/AOC: Garage S	S06	FE	ET FRO	M FIXED P	OINT:	_ MAG	ENETIC HEAD	ING: _		
FIXED POINT: 24° to	southwest	corner of gar	age, 97°	to top of re	adome, 356° to nort	hwest	corner of gara	ge.		
SAMPLE MATRIX:			nt (SD)		Surface Water (SW)		Groundwater	(GW)		
SAMPLERS: <u>SS, RC</u> TIME SAMPLED: <u>14</u>	٠20		TOTU OF	CAMBLE	Yout).					
SAMPLE DESCRIPTION	ON/COMME	ENTS: <u>Same</u>	location	as LAY-SS	06-SW01. Sandy	gravel,	saturated, iror	n stain	ing, distinct	
hydrocarbon odor.										
SAMPLING METHOD);									
QA/QC SAMPLES CO	DLLECTED:	☐ Equipm	nent Blan	ık (EB)	☐ QA/QC Ext	ra Volu	ımes			
☐ Trip Blank (TB)		☐ Duplica	ite of Wa	ter Sample	ID					
Ambient Conditio	n Blank (AE	3) 🗌 Replica	te of Soi	I Sample ID						
WATER PARAMETERS										
TIME	PH	CON	IDUCTIV	ITY	TEMPERATURE SPECIFIC GRAVITY			Y T	URBIDITY	
BG=0.5 MONITORING READINGS										
73.45	PID READING (ppm) CG/LEL (%)				HANBY SCREEN	IING				
TIME		ing (ppm)	CG/LE	:L (%)	(standard/ppm)				-	
14:30	BG in BZ		ļ							
					1					
BG=Background;	BZ=Breath	ing Zone; BH=	=Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncor	tained)	
		√	CHECK	ANALYSES	REQUESTED					
		BAR	ROW LA	.В			ANCHO	RAGE	LAB	
ANALYSES	/	CON	NTAINER	s	ANALYSES	/	CON	TAINE	RS	
		WATER	₹	SOIL			WATER		SOIL	
ТРН	1	1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz	
PCB	1				SVOC (8270)		1 liter		8 oz	
PESTICIDES					TOTAL METALS		1 liter		8 oz	
HVOC 8010	1	1 x 40 mi		4 oz	DISS METALS		1 liter			
VOC-BTEX 8020	1				TDS		250 ml			
					TSS		250 ml			
					тос		500 ml		4 oz	
					TCLP		2 liters		2 x 8 oz	

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO $_3$ to pH <2; Ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>08/24/93</u>			SA	MPLE I	D: <u>LAY-SS</u> (06-SD02				
RADAR STATION: Po	oint Lay		WE	EATHER	: Partly clo	udy, breezy, 50°F				
SITE/AOC: Garage S	S06		FE	ET FRO	M FIXED P	OINT:	M <i>A</i>	GNETIC HEA	DING:	
FIXED POINT: 69° to										
SAMPLE MATRIX: SAMPLERS: SS, RC		■ S	Sedime	nt (SD)		Surface Water (SW)		Groundwater	(GW)	
TIME SAMPLED: <u>15:</u>			DE	PTH OF	SAMPLE	(feet):				
SAMPLE DESCRIPTION	N/COMME	NTS: S	ame lo	cation as	LAY-SS06	-SW02. Grayish-bla	ck sand	ly gravel, satur	ated, i	ron staining,
1/4 to 1.5 inch gravel,										
SAMPLING METHOD:						·				
QA/QC SAMPLES CC	LLECTED:		Equipm	ent Blan	k (EB)	☐ QA/QC Ext	ra Volu	ımes		
						ID				
☐ Ambient Condition	n Blank (AE	3) 🗆 F	Replicat	e of Soi	i Sample II)				
				WA	TER PARAM	METERS	T			
TIME	PH		CON	DUCTIV	ITY	TEMPERATURE	SPE	CIFIC GRAVIT	ΥT	URBIDITY
	<u> </u>									
				MON	ITORING R	EADINGS				
						HANBY SCREEN	IING			
TIME	TIME PID READING (F			CG/LE	L (%)	(standard/ppm)				
									-	
BG-Background: F	37=Breath	ina Zone	e: BH=	Boreho	e: NR=No	Readings; HS=Hea	dspace	e; S=Sample (uncor	rtained)
BG=Background, I	32-010uiii	g 2011				REQUESTED	•			
						REQUESTED		ANCHO	DAGE	LAR
			BAH	ROW LA	.B			ANOTIC	nade	
ANALYSES			CON	TAINER	S	ANALYSES	1	CON	TAINE	RS
		V	VATER		SOIL			WATER	14.	SOIL
ТРН	1	1 liter			8 oz	VOC (8260)		3 x 40 ml		4 oz
РСВ	1					SVOC (8270)		1 liter		8 oz
PESTICIDES						TOTAL METALS		1 liter		8 oz
HVOC 8010	1	1 x 40	ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020						TDS		250 ml		
						TSS		250 ml		
						TOC		500 ml		4 oz
						TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>08/24/93</u>			SAI	MPLE I	D: <u>LAY-SSC</u>	6-SD03		·			
RADAR STATION: P	oint Lay		WE	ATHER	: Partly clo	udy, breezy, 50°F					
SITE/AOC: Garage S	SS06		FE	ET FRO	M FIXED P	OINT:	MA	GNETIC HEA	DING:		
FIXED POINT: 61° to	o northwest	corner o	f garag	qe, 88°	to southwe	st corner of garage	89° to	top of radom	10.		
SAMPLE MATRIX:	` '	■ Se	edimer	nt (SD)		urface Water (SW)		Groundwater	(GW)		
SAMPLERS: <u>SS, RC</u> TIME SAMPLED: <u>13</u>				DTI 05		Y					
SAMPLE DESCRIPTION										ample taken	
at outflow of culvert.	OIN/COIVINE	1415. <u>Fe</u>	ayıav	BI 10 3/4	· IIICII, 3-0%	Sand, Iron Stairing,	Olyania	Jillateriai pres	eiii. S	ample taken	
SAMPLING METHOD):		···.								
QA/QC SAMPLES CO	OLLECTED:	□ E	quipme	ent Blan	k (EB)	☐ QA/QC Ext	ra Volu	ımes			
☐ Trip Blank (TB)		□ Di	uplicat	e of Wa	ter Sample	ID					
☐ Ambient Condition	n Blank (AE	3) 🗆 Re	eplicate	e of Soi	l Sample ID						
WATER PARAMETERS											
TIME	PH		CON	DUCTIV	ITY	TEMPERATURE	SPE	CIFIC GRAVIT	ү т	URBIDITY	
BG=0.5 MONITORING READINGS											
						HANBY SCREEN	IING				
TIME	PID READ	READING (ppm)			L (%)	(standard/ppm)					
13:40	BG in BZ										
BG=Background;	BZ=Breath	ing Zone	; BH=	Borehol	e; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncor	tained)	
			✓ (CHECK	ANALYSES	REQUESTED				-	
			BARF	ROW LA	В			ANCHO	RAGE	LAB	
ANALYSES	1		CON	TAINER	s	ANALYSES	/	CON	TAINE	RS	
		W	/ATER		SOIL			WATER		SOIL	
ТРН	1	1 liter			8 oz	VOC (8260)		3 x 40 ml		4 oz	
РСВ	/					SVOC (8270)		1 liter		8 oz	
PESTICIDES						TOTAL METALS		1 liter		8 oz	
HVOC 8010	1	1 x 40	ml		4 oz	DISS METALS		1 liter			
VOC-BTEX 8020	1					TDS		250 ml			
						TSS		250 ml			
						тос		500 ml		4 oz	
						TCLP		2 liters		2 x 8 oz	

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; Ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>08/24/93</u>		SA	MPLE I	D: <u>LAY-SS</u> (06-SD04							
RADAR STATION: <u>Po</u>	oint Lay	W	EATHER	: Partly clo	oudy, 45°F							
SITE/AOC: Garage S	S06	FE	ET FRO	M FIXED P	OINT:	_ MAG	NETIC HEADI	NG: _				
FIXED POINT: 98° to									ng train.			
SAMPLE MATRIX: [SAMPLERS: <u>SS, RC</u>	:							(GW)				
TIME SAMPLED: 16	:05	DE	PTH OF	SAMPLE	(feet):							
SAMPLE DESCRIPTION	ON/COMME	NTS: Same I	ocation.	Dark gray,	sandy gravel, iron	staining	g, sheen on sa	ımple,	saturated.			
SAMPLING METHOD												
QA/QC SAMPLES CO	DLLECTED:											
☐ Trip Blank (TB)	D				ID							
☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID												
			WA	TER PARAM	METERS	T		- 				
TIME	PH	CON	DUCTIV	ITY	TEMPERATURE	SPE	CIFIC GRAVIT	YT	URBIDITY			
	1											
MONITORING READINGS												
		HANBY SCREEN	IING									
TIME	TIME PID READING (pp			L (%)	(standard/ppm)							
	·····							-				
								l				
BG=Background;	BZ=Breath	ing Zone; BH=	=Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample (uncor	tained)			
		1	CHECK	ANALYSES	REQUESTED							
		BAR	ROW LA	ΔB			ANCHO	RAGE	LAB			
ANALYSES	1	CON	NTAINER	s	ANALYSES	1	CON	TAINE	RS			
		WATER	}	SOIL			WATER		SOIL			
ТРН	1	1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz			
РСВ	1				SVOC (8270)		1 liter		8 oz			
PESTICIDES					TOTAL METALS		1 liter		8 oz			
HVOC 8010	/	1 x 40 ml		4 oz	DISS METALS		1 liter					
VOC-BTEX 8020	1				TDS		250 ml					
					TSS		250 ml					
					тос		500 ml		4 oz			
					TCLP		2 liters		2 x 8 oz			

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: <u>08/24/93</u>			_SAMPLE I	D: LAY-SS	06-SW01					
RADAR STATION: P	oint Lay	•	_WEATHER	R: Partly clo	oudy, breezy, 50°F				*****	
SITE/AOC: <u>Garage S</u>	SS06		_FEET FRO	OM FIXED P	OINT:	MA				
FIXED POINT: 24° to	southwest	corner of	garage, 97°	to top of ra	adome, 356°to north	west c	orner of garag	е.		
SAMPLE MATRIX:] Soil (S)	☐ Sec	diment (SD)	= 9	Surface Water (SW)		Groundwater	(GW)		
SAMPLERS: <u>SS, RC</u>	<u> </u>									
TIME SAMPLED: 14										
SAMPLE DESCRIPTION	ON/COMME	ENTS: <u>Sar</u>	ne location	as LAY-SS0	6-SD01.					
SAMPLING METHOD):									
QA/QC SAMPLES CO		☐ Eau	uipment Bla	nk (EB)	☐ QA/QC Ex	tra Volu	umes			
—		-	•		ID					
☐ Ambient Conditio	n Blank (AE	3) 🗆 Rep	olicate of So	il Sample ID)					
				TER PARAM						
TIME	PH		CONDUCTIV		TEMPERATURE	SPE	CIFIC GRAVIT	v T	URBIDITY	
						 		` -	011.0.0111	
13:35	7.5	8	320 μS		10°C	1.00	1			
BG=0.5			MON	IITORING R	EADINGS					
HANBY SCREENING										
TIME	PID READ	ING (ppm)) CG/LE	EL (%)	(standard/ppm)	iiiVG				
14:22	BG in BZ									
17.22	BG 111 BZ									
			<u> </u>	 	1					
BG=Background;	BZ=Breath	ing Zone; I	BH=Boreho	ole; NR=No	Readings; HS=Hea	dspace	e; S=Sample (uncor	ntained)	
			✓ CHECK	ANALYSES	REQUESTED					
		E	BARROW LA	AΒ			ANCHO	RAGE	LAB	
4417/020			CONTAINER		41117050		CON	TAINE	De	
ANALYSES	/				ANALYSES	<i>y</i>		IAINE	·	
		WA	TER	SOIL			WATER		SOIL	
TPH	1	1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz	
PCB					SVOC (8270)		1 liter		8 oz	
PESTICIDES					TOTAL METALS		1 liter		8 oz	
HVOC 8010		1 x 40 m	1	4 oz	DISS METALS		1 liter			
VOC-BTEX 8020	8020 J TDS						250 ml			
					TSS		250 ml			
					тос		500 ml		4 oz	
					TCLP		2 liters		2 x 8 oz	
IL										

Preservation: HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; lce all samples to 4°C

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

Sample ID Format:

DATE: <u>08/24/93</u>			SAMPLE I	D: <u>LAY-SS</u>	06-SW02				
RADAR STATION: Po	oint Lay		WEATHER	R: Partly clo	oudy, breezy, 50°F				
SITE/AOC: Garage S	S06		FEET FRO	M FIXED P	OINT:	M	AGNETIC HEA	DING	:
FIXED POINT: 69° to									
SAMPLE MATRIX:		∐ Sedi	ment (SD)	= \$	Surface Water (SW)	L	Groundwater ((GW)	
SAMPLERS: <u>SS, RC</u> TIME SAMPLED: <u>15</u>			DEPTH O	F SAMPLE	(feet):				
SAMPLE DESCRIPTION	ON/COMME	ENTS: Sam	e location	as LAY-SSC	6-SD02.				
SAMPLING METHOD									
QA/QC SAMPLES CO									
☐ Trip Blank (TB)	· · · · ·	☐ Dupl	icate of Wa	ater Sample	ID				
Ambient Condition	n Blank (At	3) L Repi	cate of Sc	ii Sampie it)				
			WA	TER PARAM	METERS				
TIME	PH	C	ONDUCTIV	/ITY	TEMPERATURE	SPE	CIFIC GRAVIT	ΥT	URBIDITY
13:35	7.4	590 μS			8°C	1.00	2		
						1			
			MON	IITORING R	EADINGS		Γ	 	
T1.4F) (mmm)	66/1	-1 (0/)	HANBY SCREEN (standard/ppm)	IING			
TIME	PID REAL	ING (ppm)	om) CG/LEL (%)		(Startuaru/ppini)			_	
					ļ			╁	
							ł.		
BG=Background;	BZ=Breath	ing Zone; B	H=Boreho	ole; NR=No	Readings; HS=Hea	dspace	e; S=Sample (uncor	ntained)
			✓ CHECK	ANALYSES	S REQUESTED				
		В	ARROW LA	AB			ANCHO	RAGE	LAB
			ONTAINER		ANALYSES		CON	TAINE	RS
ANALYSES	1			T	ANALYSES	/	I	1731146	SOIL
		WAT	ER	SOIL			WATER		
TPH	1	1 liter		8 oz	VOC (8260)	1	3 x 40 ml		4 oz
РСВ					SVOC (8270)	1	1 liter	-	8 oz
PESTICIDES					TOTAL METALS	1	1 liter		8 oz
HVOC 8010		1 x 40 ml		4 oz	DISS METALS	1	1 liter		
VOC-BTEX 8020	1				TDS		250 ml		
					TSS		250 ml		
					тос		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>08/24/93</u> SAMPLE ID: <u>LAY-SS06-SW03</u>											
RADAR STATION: P	oint Lay		WI	EATHER	R: Partly clo	oudy, breezy, 50°F					
SITE/AOC: Garage S	S06		F	FEET FF	ROM FIXED	POINT:	١	MAGNETIC HE	ADING	3:	
FIXED POINT: 29° to	southwes	t corner	of gara	age, 97°	to top of ra	adome, 356° to non	hwest	corner of gara	ge.		
SAMPLE MATRIX:	_										
SAMPLERS: SS, RC TIME SAMPLED: 14	.os	-		-DTIL O		/r N					
SAMPLE DESCRIPTION	JN/COMMI	=N15: <u>L</u>	Juplica	te of Sv	<u>v</u> U1.						
SAMPLING METHOD	:										
QA/QC SAMPLES CO	DLLECTED	: 🗆 E	quipm	ent Blar	nk (EB)	☐ QA/QC Ex	tra Volu	umes			
☐ Trip Blank (TB)		■ D)uplica	te of Wa	ater Sample	ID LAY-SS06-SW0	1				
Ambient Conditio	n Blank (Al	3) 🗆 R	Replica	te of So	il Sample II)					
	····			WA ⁻	TER PARAM	METERS	· · · · · · · · · · · · · · · · · · ·				
TIME	PH		CON	DUCTIV	'ITY	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY	
13:31	7.5		820 µ	ιS		10°C	1.00	1			
BG=0.5 MONITORING READINGS											
						HANBY SCREEN	IING		i		
TIME	PID READ	ING (pp	m)	CG/LE	L (%)	(standard/ppm)					
14:27	BG in BZ										
BG=Background;	BZ=Breath	ing Zone	; BH=	Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncor	ntained)	
			1	CHECK	ANALYSES	REQUESTED					
			BAR	ROW LA	ιB			ANCHO	RAGE	LAB	
ANALYSES	1		CON	TAINER	S	ANALYSES	/	CON	TAINE	RS	
		٧	VATER		SOIL			WATER		SOIL	
TPH	1	1 liter			8 oz	VOC (8260)	-	3 x 40 ml		4 oz	
РСВ						SVOC (8270)		1 liter		8 oz	
PESTICIDES						TOTAL METALS		1 liter		8 oz	
HVOC 8010		1 x 40	ml		4 oz	DISS METALS		1 liter			
VOC-BTEX 8020	/	/ TDS 250 ml									
						TSS		250 ml			
						тос		500 ml		4 oz	
						TCLP		2 liters		2 x 8 oz	

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>08/24/93</u>			_SAMPLE I	D: <u>LAY-SS</u> (06-SW04				
RADAR STATION: Po									
SITE/AOC: <u>Garage S</u>									· · · · · · · · · · · · · · · · · · ·
FIXED POINT: 78° to	NE corner	of garage,	86° to top						
SAMPLE MATRIX: SAMPLERS: SS, RC		☐ Sedi	iment (SD)	■ 9	Surface Water (SW)		Groundwater	(GW)	
TIME SAMPLED: <u>16</u>	·00		DEPTH OF	SAMPLE	(feet):				
SAMPLE DESCRIPTION									
O/WIII CE DEGOTIII TI	, , , , , , , , , , , , , , , , , , ,	<u></u>							
SAMPLING METHOD									
QA/QC SAMPLES CO	DLLECTED:								
☐ Trip Blank (TB)					ID				
☐ Ambient Condition	n Blank (AE	3) 🗌 Rep	licate of So	il Sample ID)				
			WA ⁻	TER PARAN	METERS				
TIME	PH	С	ONDUCTIV	'ITY	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY
13:35	7.3	50	60 μS		11°C	1.00	0		
			MON	ITORING R	EADINGS				
					HANBY SCREEN	IING			
TIME PID READING (p			CG/LE	L (%)	(standard/ppm)				
BG=Background;	BZ=Breath	ing Zone; E	3H=Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample	uncor	ntained)
			✓ CHECK	ANALYSES	REQUESTED				
		В	ARROW LA	\B			ANCHO	RAGE	LAB
ANALYSES	1	C	ONTAINER	s	ANALYSES	1	CON	TAINE	RS
,	-	WA	TER .	SOIL			WATER		SOIL
ТРН	1	1 liter	y- 000	8 oz	VOC (8260)		3 x 40 ml		4 oz
РСВ					SVOC (8270)		1 liter		8 oz
PESTICIDES					TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40 ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1				TDS		250 ml		
					TSS		250 ml		
					тос		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz

Preservation:

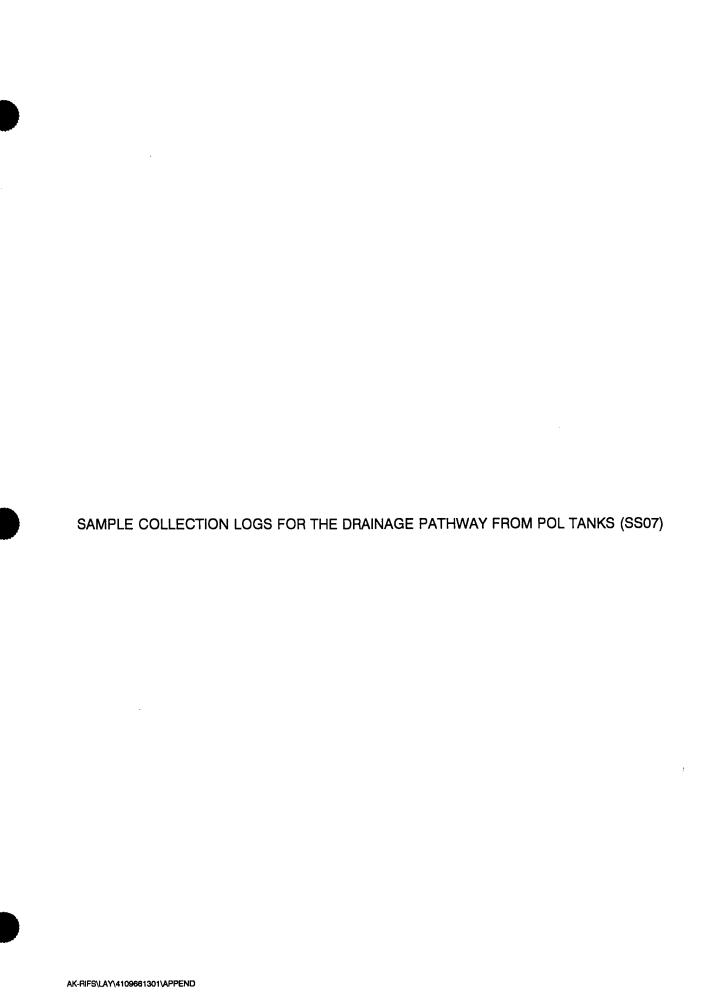
HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:



DATE: <u>09/07/93</u>			SA	MPLE I	D: <u>LAY-SS</u>	07-2SD05				
RADAR STATION: P	oint Lay		WE	ATHER	: Raining,	31°F				
SITE/AOC: POL Drai	inage SS07		FE	ET FRO	M FIXED P	OINT:	_ MAG	ENETIC HEAD	ING: _	
FIXED POINT: Down	stream of S	S07-SW	01 and	SD01,	at base of	bluff, next to beach,	16° to	radome.		
SAMPLE MATRIX:	Soil (S)	■ S	edimer	nt (SD)		Surface Water (SW)		Groundwater	(GW)	
SAMPLERS: <u>ASP, J</u>										
TIME SAMPLED: 17										
SAMPLE DESCRIPTION	ON/COMME	ents: <u>s</u>	andy o	gravel.	Same locati	ion as SS07-2SW05	·			
SAMPLING METHOD	: Grab									
QA/QC SAMPLES CO		ПЕ	auipm	ent Blan	ık (EB)	□ QA/QC Ex	ra Volu	ımes		
_						ID				
☐ Ambient Conditio										
				WA	TER PARAN	METERS			****	
TIME	PH		CON	DUCTIV	ITY	TEMPERATURE	SPE	CIFIC GRAVIT	ΥT	URBIDITY
									_	
		_								
,				MON	ITORING R	EADINGS				
						HANBY SCREEN	IING			
TIME	PID READ	ING (pp	m)	CG/LE	L (%)	(standard/ppm)				
					-					
BG=Background:	BZ=Breath	ina Zone	: BH=	Boreho	le: NR=No	Readings; HS=Hea	dspace	: S=Sample	uncor	tained)
,						S REQUESTED				
						REQUESTED		ANOUG	ND 4 OF	LAD
			BAH	ROW LA	'R			ANCHO	PRAGE	LAB
ANALYSES	1		CON	TAINER	S	ANALYSES	/	CON	TAINE	RS
		W	VATER		SOIL			WATER		SOIL
TPH		1 liter			8 oz	VOC (8260)		3 x 40 ml		4 oz
РСВ						SVOC (8270)		1 liter		8 oz
PESTICIDES						TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40	ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	J					TDS		250 ml		
VPH	1					TSS		250 ml		
EPH	1					тос		500 ml		4 oz
						TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; Ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>09/07/93</u>			SAN	MPLE I): <u>Lay-ss</u> ()7-2SD06				
RADAR STATION: Po	int Lay		WE	ATHER	: Raining,	31°F				
SITE/AOC: POL Drair	nage SS07		_ FEE	T FRO	M FIXED P	OINT:	_ MAG	ENETIC HEAD	ING: _	
FIXED POINT: Downs										
SAMPLE MATRIX: 🗆	Soil (S)	■ Se	dimen	t (SD)	□s	Surface Water (SW)		Groundwater	(GW)	
SAMPLERS: <u>ASP, JF</u>	-									
TIME SAMPLED: 17:	35		_ DEF	PTH OF	SAMPLE ((feet):				
SAMPLE DESCRIPTIO)N/COMME	ENTS: <u>Sa</u>	andy gi	ravel.	same locati	on as SSU7-2SVVU6	•			
SAMPLING METHOD:	Scoop at	ab								
QA/QC SAMPLES CC			nuipme	nt Blan	k (EB)	☐ QA/QC Ext	ra Volu	ımes		
						ID				
☐ Ambient Condition										
				-	TER PARAN					===
	Τ					······································	CDE	CIFIC GRAVIT	v T	URBIDITY
TIME	PH		COND	UCTIV	ΙΥ	TEMPERATURE	SPE	CIFIC GRAVII	1 1	UNBIDITT
								·		
	<u> </u>						<u> </u>			
				MON	TORING R	EADINGS				
				00#5	1 (0/)	HANBY SCREEN	IING			
TIME	PID READ	ING (ppn	n)	CG/LE	L (%)	(standard/ppm)			-	
										·
BG=Background; (3Z=Breath	ing Zone;	BH=E	Borehol	e; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncor	ntained)
						REQUESTED				
	<u> </u>					REGOLUTED		ANOUG	NDA 05	LAD
			BARR	OW LA	В			ANCHO	HAGE	LAD
ANALYSES	1		CONT	TAINER	S	ANALYSES	1	CON	TAINE	RS
		W	ATER		SOIL			WATER		SOIL
ТРН		1 liter			8 oz	VOC (8260)		3 x 40 ml		4 oz
РСВ						SVOC (8270)		1 liter		8 oz
PESTICIDES						TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40 r	ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1					TDS		250 ml		
VPH	1			!		TSS		250 ml		
EPH	1					тос		500 ml		4 oz
						TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: <u>09/07/93</u>			SA	MPLE ID	D: <u>LAY-SS</u>	7-2SD07				
RADAR STATION: P	oint Lay		WE	ATHER	Raining,	34°F				
SITE/AOC: <u>POL Drai</u>	nage SS07		FE!	ET FRO	M FIXED P	OINT:	м	AGNETIC HEA		
FIXED POINT: Upstr										· · · · · · · · · · · · · · · · · · ·
SAMPLE MATRIX: SAMPLERS: <u>JP</u>				π (SD)	LIS	Surface vvater (Svv)	L	Groundwater	(GVV)	
TIME SAMPLED: 16	5:00		DE	PTH OF	SAMPLE	(feet):				.,,,,,,,,
SAMPLE DESCRIPTION										
SAMPLING METHOD	•									
QA/QC SAMPLES CO										
☐ Trip Blank (TB)☐ Ambient Conditio										
Ambient Conditio	וו טומווא (אנ	<i>y</i> – ne	plicat							
	1				ER PARAN		Γ			
TIME	PH		CON	DUCTIV	ITY	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY
							ļ	· · · · · · · · · · · · · · · · · · ·		
	•			MON	TORING R	EADINGS				
						HANBY SCREEN	IING			
TIME	PID READ	ING (ppr	n)	CG/LE	L (%)	(standard/ppm)				
									1	
BG=Background:	B7=Breath	ina Zone	· BH=	Borehol	e. NB=No	Readings; HS=Hea	dspace	e: S=Sample	uncor	ntained)
Ba-baokg.caria,		ing Zono,		-	,					
	T					REQUESTED				
			BARF	ROW LA	В			ANCHO	RAGE	LAB
ANALYSES	1		CON	TAINER	S	ANALYSES	1	CON	TAINE	RS
		w	ATER		SOIL			WATER		SOIL
TPH		1 liter			8 oz	VOC (8260)	/	3 x 40 ml		4 oz
РСВ						SVOC (8270)		1 liter		8 oz
PESTICIDES				į		TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40	ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1					TDS		250 ml		
VPH	1					TSS		250 ml		
EPH	1					тос		500 ml		4 oz
						TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>9/07/93</u>			SAI	MPLE I	D: <u>LAY-SS</u> ()7-2SW04				
RADAR STATION: PO	oint Lay		WE	ATHER	: Raining,	breezy, 34°F				
SITE/AOC: POL Drai	nage, SS07		FEI	ET FRO	M FIXED P	OINT:	м	AGNETIC HE	ADING	:
FIXED POINT: Down	stream of S	S07, sar	me loca	ation as	SS07-SW0	3 and SS07-SD03.				
SAMPLE MATRIX:	Soil (S)	□ s	edimer	nt (SD)	S	Surface Water (SW)		Groundwater	(GW)	
SAMPLERS: JP										
TIME SAMPLED: 16	3:00		DE	PTH OF	SAMPLE ((feet):				
SAMPLE DESCRIPTION	ON/COMME	NTS: <u>C</u>	lear at	ove rus	t colored s	ediment.				
SAMPLING METHOD	: Grab									
QA/QC SAMPLES CO	OLLECTED:					☐ QA/QC Ext				
☐ Trip Blank (TB)						ID			 -	
☐ Ambient Conditio	n Blank (AE) ∐ R	eplicate	e of Soi	I Sample ID) Was Table				
				WAT	TER PARAN	METERS				
TIME	PH		CONI	DUCTIV	ITY	TEMPERATURE	SPE	CIFIC GRAVIT	ΥT	URBIDITY
TIVIC	1111		00111	300111						
							<u> </u>			
						_				
				MON	ITORING R	EADINGS				
						HANBY SCREEN	IING			
TIME	PID READ	ING (pp	m)	CG/LE	L (%)	(standard/ppm)			_	
			1							
DO Brokenswad	DZ Drooth	7000	. DU.	Porobo	lo: NR-No	Readings; HS=Hea	denace	s: S=Sample	(uncor	tained)
BG=Background;	DZ=Dreath	ing Zone	s, Dn=	DOIGNO	ie, 1411=140	110001195, 110-1100	Сорио	5, O — Gairripio	(6,1,6,5)	,
			1	CHECK	ANALYSES	REQUESTED				
			BARF	ROW LA	В			ANCHO	RAGE	LAB
			001	TAINIED	<u> </u>	4414050	,	CON	TAINE	RS.
ANALYSES	/		CON	TAINER	3	ANALYSES	/	001	174114	
		W	VATER		SOIL			WATER		SOIL
TPH		1 liter			8 oz	VOC (8260)	1	3 x 40 ml		4 oz
РСВ						SVOC (8270)		1 liter		8 oz
PESTICIDES						TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40	ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1	1 7 40				TDS		250 ml		
VPH	1		 	<u> </u>		TSS		250 ml		
EPH	1					тос		500 ml		4 oz
						TCLP		2 liters		2 x 8 oz
	_			· · · · · · · · · · · · · · · · · · ·						
	1	l					<u> </u>			

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: <u>9/07/93</u>			SA	MPLE I	D: <u>LAY-SS</u> (7-2SW05				· · · · · · · · · · · · · · · · · · ·
RADAR STATION: PO								·		
SITE/AOC: POL Drai	nage, SS07		FE	ET FRO	M FIXED P	OINT:	M	AGNETIC HEA	ADING	:
FIXED POINT: <u>Down</u>	stream of S	S07-SW	01 and	SD01,	at base of	oluff, next to beach,	16° to	radome.		
SAMPLE MATRIX:] Soil (S)	□s	edime	nt (SD)	S	Surface Water (SW)		Groundwater	(GW)	
SAMPLERS: <u>JP, AS</u>	Р									
TIME SAMPLED: 17										
SAMPLE DESCRIPTION	ON/COMME	NTS: _								
							-			
SAMPLING METHOD										
QA/QC SAMPLES CO										
						ID			·	
Ambient Condition	n Blank (AE	s) ⊔ H	eplicat	e of Soi	i Sample ID					
				WA	TER PARAN	METERS				
TIME	PH		CON	DUCTIV	IΤΥ	TEMPERATURE	SPE	CIFIC GRAVIT	Υ Т	URBIDITY
									+	
				MON	ITORING R	EADINGS				
						HANBY SCREEN	IING		T	
TIME	PID READ	iNG (pp	m)	CG/LE	L (%)	(standard/ppm)	IIIVG			
									+	
BG=Background;	BZ=Breath	ing Zone	e; BH=	Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncon	tained)
		****	1	CHECK	ANALYSES	REQUESTED				
								ANCHO	NDACE	LAR
			BAH	ROW LA	'D			ANUTIC	TRAGE	LAB
ANALYSES	1		CON	TAINER	S	ANALYSES	1	CON	TAINE	RS
		V	VATER		SOIL			WATER		SOIL
ТРН		1 liter			8 oz	VOC (8260)	1	3 x 40 ml		4 oz
РСВ						SVOC (8270)		1 liter		8 oz
PESTICIDES		:				TOTAL METALS	******	1 liter		8 oz
HVOC 8010		1 x 40	mi		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	/					TDS		250 ml		
VPH	1			<u></u>		TSS		250 ml		
EPH	1					тос		500 ml		4 oz
						TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

RADAR STATION: <u>Po</u>	oint Lay		WE	ATHER	: Drizzling,	breezy, 31°F				
SITE/AOC: POL Drain	nage SS07		FE	ET FRO	M FIXED P	OINT:	M	AGNETIC HEA	DING	·
FIXED POINT: Downs	stream of S	S07-SW	/02 and	SD02,						
SAMPLE MATRIX:	• •	□ s	edimer	nt (SD)	S	Surface Water (SW)		Groundwater	(GW)	
SAMPLERS: <u>JP, ASI</u> TIME SAMPLED: <u>17</u>	·30			DTU OF	CAMPLE	(foot):				
SAMPLE DESCRIPTION										
SAMELE DESCRIPTION		.1410. <u>C</u>	Jibai.	·						
SAMPLING METHOD										
QA/QC SAMPLES CC	DLLECTED:		Equipmo	ent Blan	ik (EB)	☐ QA/QC Ext	ra Volu	ımes		
☐ Trip Blank (TB)						ID				
☐ Ambient Condition	n Blank (AE	3) 🗆 R	Replicat	e of Soi	l Sample ID)				
			-	WAT	TER PARAN	METERS				
TIME	PH		CON	DUCTIV	ITY	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY
				MON	ITORING R	EADINGS				
						HANBY SCREEN	IING			
TIME	PID READ	ING (pp	om)	CG/LE	L (%)	(standard/ppm)				
BG=Background;	BZ=Breath	ing Zone	e; BH=	Borehol	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample	uncor	tained)
						REQUESTED				
			BARF	ROW LA	.B			ANCHO	RAGE	LAB
ANALYSES	1		CON	TAINER	S	ANALYSES	/	CON	TAINE	RS
AIVALIOLO		V	VATER		SOIL			WATER		SOIL
TPH		1 liter			8 oz	VOC (8260)	1	3 x 40 ml	***********	4 oz
РСВ						SVOC (8270)		1 liter		8 oz
PESTICIDES						TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40	ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1					TDS		250 ml		
VPH	1					TSS		250 ml		
EPH	1					тос		500 ml		4 oz
						TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; Ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>08/24/93</u>		S	AMPLE IC): <u>LAY-SSC</u>	7-SD01				
RADAR STATION: PO	oint Lay	W	EATHER						
SITE/AOC: POL Drai						MA	GNETIC HEA	DING:	200.5°
FIXED POINT: South									
SAMPLE MATRIX:			ent (SD)	∟s	surface Water (SW)	Ш	Groundwater ((GW)	
SAMPLERS: <u>JP, DN</u> TIME SAMPLED: <u>13</u>			EDTH OF	SAMPLE	'foot\·				
SAMPLE DESCRIPTION	ON/COMME	NTS: Beainn	ing of so	uth leachate	e stream. Same loca	ation as	LAY-SS07-SV	V01. C	Drganic, silt.
SAMPLING METHOD	: Grab								
QA/QC SAMPLES CO									
☐ Trip Blank (TB)		☐ Duplica	ate of Wa	ter Sample	ID				
☐ Ambient Conditio	n Blank (AB	s) Li Replica	ate or Soi	i Sample ID					
			WAT	ER PARAN	METERS				
TIME	PH	COL	NDUCTIV	ITY	TEMPERATURE	SPE	CIFIC GRAVIT	YT	URBIDITY
						ļ			
			***************************************	··					
1						1			
			MON	ITORING R	EADINGS				
TIME	DID DEAD	ING (ppm)	CG/LE	:I (%)	HANBY SCREEN (standard/ppm)	IING			
THALE	TID NEAD	iiii (ppiii)	JOUPEL	(70)	(Gtarioard/pp://)				
			<u> </u>						
			<u> </u>						
BG=Background;	BZ=Breath	ing Zone; BH	=Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncon	tained)
			CHECK	ANALYSES	REQUESTED				
		BAF	RROW LA	ιB		1	ANCHO	RAGE	LAB
ANALYSES		СО	NTAINER	S	ANALYSES	1	CON	TAINE	RS
7.17.12.102.0		WATE	R	SOIL			WATER		SOIL
TPH	1	1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz
PCB		1 11101			SVOC (8270)		1 liter		8 oz
PESTICIDES					TOTAL METALS		1 liter		8 oz
		4 401		4					0 02
HVOC 8010		1 x 40 ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1				TDS	<u> </u>	250 ml		
					TSS		250 ml		
					тос		500 ml	1	4 oz
					TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>08/24/93</u>			SAMPLE I	D: <u>LAY-SS</u>	07-SD02				
RADAR STATION: <u>P</u>									
SITE/AOC: POL Drai							MAGNETIC H	EADIN	G: <u>214°</u>
FIXED POINT: South							·		
SAMPLE MATRIX: [SAMPLERS: JP, DN		Sedir	nent (SD)		Surface Water (SW)		Groundwater	(GW)	
TIME SAMPLED: 13			DEPTH O	F SAMPLE	(feet):				
SAMPLE DESCRIPTION						tion as	SW02. Gravel	y silt, c	onsiderable
organics.									
SAMPLING METHOD	: Grab								
QA/QC SAMPLES C	OLLECTED:	☐ Equip	ment Bla	nk (EB)	☐ QA/QC Ex	tra Vol	umes		
☐ Trip Blank (TB)					ID				
☐ Ambient Conditio	n Blank (Al	3) 🗌 Repli	cate of So	il Sample II)				
			WA	TER PARAI	METERS				
TIME	PH	CC	NDUCTIV	/ITY	TEMPERATURE	SPE	CIFIC GRAVIT	ΥT	URBIDITY
THVIC		- 00	NOOTIV		TEMP ENVIORE	1		<u> </u>	
						 			
		j							
			MON	IITORING R	EADINGS				
					HANBY SCREEN	JING			
TIME	PID READ	ING (ppm)	CG/LE	EL (%)	(standard/ppm)				
		•							
								_	
							1		
BG=Background;	BZ=Breath	ing Zone; Bl	1=Boreho	ole; NR=No	Readings; HS=Hea	idspac	e; S=Sample	(uncor	itainea)
			✓ CHECK	ANALYSE	S REQUESTED				
		B/	RROW LA	\R			ANCHO	RAGE	LAB
		Dr.	INNOW D						
ANALYSES	1	C	ONTAINEF	RS	ANALYSES	1	CON	TAINE	RS
		WAT	ER	SOIL			WATER		SOIL
TPH	1	1 liter		8 oz	VOC (8260)	1	3 x 40 ml		4 oz
РСВ					SVOC (8270)	1	1 liter		8 oz
PESTICIDES				ļ	TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40 ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1				TDS		250 ml		
					TSS		250 ml		
					тос		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: 08/24/93		SA	MPLE I	D: <u>LAY-SSC</u>	7-SD03				
RADAR STATION: PO									
SITE/AOC: POL Drai	nage SS07	FE	ET FRO	M FIXED P	OINT: <u>159</u>	ا	MAGNETIC H	EADIN	G: <u>231°</u>
FIXED POINT: South	west corner	r of berm arou	nd horiz	ontal tanks.					
SAMPLE MATRIX:] Soil (S)	Sedime	nt (SD)	□s	Surface Water (SW)		Groundwater	(GW)	
SAMPLERS: JP, DN									
TIME SAMPLED: 11	:45	DE	PTH OF	SAMPLE ((feet):				
SAMPLE DESCRIPTION	ON/COMME	NTS: Pool at	bottom	of north lea	chate stream. Same	e locati	on as LAY-SS	07-SW	03. Silt with
occasional gravel.									
SAMPLING METHOD									
QA/QC SAMPLES CO		•							
					ID				
Ambient Condition	n Blank (AE	B) LI Replica	e of Soi	I Sample ID					
			WA	TER PARAM	METERS				
TIME	PH	CON	DUCTIV	ITΥ	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY
	_					 			
					· · · · · · · · · · · · · · · · · · ·	<u> </u>			
			MON	ITORING R	EADINGS				
					HANBY SCREEN	IING			
TIME	PID READ	ING (ppm)	CG/LE	L (%)	(standard/ppm)				
								1	
								<u></u>	
BG=Background;	BZ=Breath	ing Zone; BH=	Boreho	e; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncon	tained)
		•	CHECK	ANALYSES	REQUESTED				
		BAR	ROW LA	B			ANCHO	RAGE	LAB
ANALYSES		CON	ITAINER	S	ANALYSES	1	CON	TAINE	RS
7.11 (7.10.10.10.10.10.10.10.10.10.10.10.10.10.		WATER	,	SOIL		_	WATER		SOIL
					V(OC (0000)				4 oz
TPH	1	1 liter		8 oz	VOC (8260)		3 x 40 ml		
PCB					SVOC (8270)		1 liter		8 oz
PESTICIDES			· · · · · ·		TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40 ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1				TDS		250 ml		
					TSS		250 ml		
					тос		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

MONITORING READINGS MONITORING READINGS	93	: ID: <u>LAY-SS07-SD04</u>		
Southwest comer of berm around horizontal tanks. SAMPLEM ATRIX: Soil (S) Sediment (SD) Surface Water (SW) Groundwater (GW) SAMPLEM ATRIX: Soil (S) Sediment (SD) Surface Water (SW) Groundwater (GW) SAMPLEM ATRIX: Soil (S) Surface Water (SW) Groundwater (GW) SAMPLED: 13:15 DEPTH OF SAMPLE (feet): SAMPLED: 13:15 DEPTH OF SAMPLE (feet): SAMPLED: 13:15 DEPTH OF SAMPLE (feet): SAMPLED: 13:15 DEPTH OF SAMPLE (feet): SAMPLEM SAMPLED: 13:15 DEPTH OF SAMPLE (feet): SAMPLEM SAMPLE	ON: Point La	ER: Sunny, 50°F		
SAMPLE MATRIX: Soil (S) Sediment (SD) Surface Water (SW) Groundwater (GW) SAMPLERS: JP, DN, JD TIME SAMPLED: 13:15 DEPTH OF SAMPLE (feet): SAMPLE DESCRIPTION/COMMENTS: Headwater of small leachate stream. Gravelly sit. Considerable organic material SAMPLING METHOD: Grab DA/QC SAMPLES COLLECTED: Equipment Blank (EB) QA/QC Extra Volumes Trip Blank (TB) Duplicate of Water Sample ID WATER PARAMETERS TIME PH CONDUCTIVITY TEMPERATURE SPECIFIC GRAVITY TURE MONITORING READINGS TIME PID READING (ppm) CG/LEL (%) HANBY SCREENING (standard/ppm) BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontain CHECK ANALYSES PROJECTED) BARROW LAB ANALYSES COLLECTED: CONTAINERS ANALYSES CONTAINERS WATER SOIL WATER TPH CONTAINERS ANALYSES PROJECTED WATER SOIL WATER TPH J 1 liter 8 02 VOC (8260) 3 x 40 ml 4 PPCB PESTICIDES TOTAL METALS 1 liter 8 8 INTERIOR SWOC (8270) 1 liter 8 8 INTERIOR SWOC (8270) 1 liter 8 8 INTERIOR SWOC (8270) 1 liter 8 8 INTERIOR SWOC (8270) 1 liter 8 8 INTERIOR SWOC (8270) 1 liter 8 8 INTERIOR SWOC (8270) 1 liter 8 8 INTERIOR SWOC (8270) 1 liter 8 8 INTERIOR SWOC (8270) 1 liter 8 8 INTERIOR SWOC (8270) 1 liter 8 8 INTERIOR SWOC (8270) 1 liter 8 8 INTERIOR SWOC (8270) 1 liter 8 8 INTERIOR SWOC (8270) 1 liter 8 8 INTERIOR SWOC (8270) 1 liter 8 8 INTERIOR SWOC (8270) 1 liter 8 8 INTERIOR SWOC (8270) 1 liter 9 8			MAGNETIC HEADING	3: <u>231°</u>
SAMPLERS: JP, DN, JD TIME SAMPLED PERCRIPTION/COMMENTS: Headwater of small leachate stream. Gravelly slit. Considerable organic material				
DEPTH OF SAMPLE (feet):		i) 🔲 Surface Water (SW) 🔲 G	Groundwater (GW)	
SAMPLE DESCRIPTION/COMMENTS: Headwater of small leachate stream. Gravelly silt. Considerable organic material SAMPLING METHOD: Grab OA/QC SAMPLES COLLECTED:	JP, DN, JD	OF SAMPLE (feet):		
ANALYSES	CRIPTION/CC	small leachate stream. Gravelly silt. Consid	derable organic mate	rial present
OA/QC SAMPLES COLLECTED:	51111 11511/5C			
Trip Blank (TB) □ Duplicate of Water Sample ID □ WATER PARAMETERS TIME PH CONDUCTIVITY TEMPERATURE SPECIFIC GRAVITY TURE MONITORING READINGS TIME PID READING (ppm) CG/LEL (%) HANBY SCREENING (standard/ppm) BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontain				
Ambient Condition Blank (AB)	LES COLLEC			
TIME				
TIME PH CONDUCTIVITY TEMPERATURE SPECIFIC GRAVITY TURE MONITORING READINGS	Condition Blan	Soil Sample ID		
MONITORING READINGS MONITORING READINGS		ATER PARAMETERS		
TIME PID READING (ppm) CG/LEL (%) HANBY SCREENING (standard/ppm) BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontain	PH	TVITY TEMPERATURE SPEC	CIFIC GRAVITY TO	JRBIDITY
TIME PID READING (ppm) CG/LEL (%) HANBY SCREENING (standard/ppm) BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontain				
TIME PID READING (ppm) CG/LEL (%) HANBY SCREENING (standard/ppm) BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontain				
TIME PID READING (ppm) CG/LEL (%) HANBY SCREENING (standard/ppm) BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontain				
TIME PID READING (ppm) CG/LEL (%) HANBY SCREENING (standard/ppm) BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontain				
TIME PID READING (ppm) CG/LEL (%) (standard/ppm) BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontain value) ✓ CHECK ANALYSES REQUESTED ANCHORAGE LA ANCHORAGE LA ANALYSES ✓ CONTAINERS ANALYSES ✓ CONTAINERS WATER SOIL WATER WATER TPH ✓ 1 liter 8 oz VOC (8260) 3 x 40 ml 4 PCB SVOC (8270) 1 liter 8 PESTICIDES TOTAL METALS 1 liter 8 HVOC 8010 1 x 40 ml 4 oz DISS METALS 1 liter		NITORING READINGS		
BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontain				
CHECK ANALYSES REQUESTED BARROW LAB ANCHORAGE LAD CONTAINERS ANALYSES CONTAINERS WATER SOIL WATER TPH ✓ 1 liter 8 oz VOC (8260) 3 x 40 ml 4 PCB SVOC (8270) 1 liter 8 PESTICIDES TOTAL METALS 1 liter 8 HVOC 8010 1 x 40 ml 4 oz DISS METALS 1 liter	PID I	LEL (%) (standard/ppm)		
CHECK ANALYSES REQUESTED BARROW LAB ANCHORAGE LAD CONTAINERS ANALYSES CONTAINERS WATER SOIL WATER TPH ✓ 1 liter 8 oz VOC (8260) 3 x 40 ml 4 PCB SVOC (8270) 1 liter 8 PESTICIDES TOTAL METALS 1 liter 8 HVOC 8010 1 x 40 ml 4 oz DISS METALS 1 liter				
CHECK ANALYSES REQUESTED BARROW LAB ANCHORAGE LA CONTAINERS ANALYSES CONTAINERS WATER SOIL WATER TPH ✓ 1 liter 8 oz VOC (8260) 3 x 40 ml 4 PCB SVOC (8270) 1 liter 8 PESTICIDES TOTAL METALS 1 liter 8 HVOC 8010 1 x 40 ml 4 oz DISS METALS 1 liter			1	
BARROW LAB ANCHORAGE LA CONTAINERS WATER SOIL WATER TPH ✓ 1 liter 8 oz VOC (8260) 3 x 40 ml 4 PCB SVOC (8270) 1 liter 8 PESTICIDES TOTAL METALS 1 liter 8 HVOC 8010 1 x 40 ml 4 oz DISS METALS 1 liter	round; BZ=B	nole; NR=No Readings; HS=Headspace;	; S=Sample (uncon	tained)
ANALYSES ✓ CONTAINERS ANALYSES ✓ CONTAINERS WATER SOIL WATER WATER TPH ✓ 1 liter 8 oz VOC (8260) 3 x 40 ml 4 PCB SVOC (8270) 1 liter 8 PESTICIDES TOTAL METALS 1 liter 8 HVOC 8010 1 x 40 ml 4 oz DISS METALS 1 liter		CK ANALYSES REQUESTED		
ANALYSES ✓ SOIL WATER TPH ✓ 1 liter 8 oz VOC (8260) 3 x 40 ml 4 PCB SVOC (8270) 1 liter 8 PESTICIDES TOTAL METALS 1 liter 8 HVOC 8010 1 x 40 ml 4 oz DISS METALS 1 liter		LAB	ANCHORAGE	LAB
WATER SOIL WATER TPH ✓ 1 liter 8 oz VOC (8260) 3 x 40 ml 4 PCB SVOC (8270) 1 liter 8 PESTICIDES TOTAL METALS 1 liter 8 HVOC 8010 1 x 40 ml 4 oz DISS METALS 1 liter	rses .	ERS ANALYSES /	CONTAINE	RS
PCB SVOC (8270) 1 liter 8 PESTICIDES TOTAL METALS 1 liter 8 HVOC 8010 1 x 40 ml 4 oz DISS METALS 1 liter			WATER	SOIL
PCB SVOC (8270) 1 liter 8 PESTICIDES TOTAL METALS 1 liter 8 HVOC 8010 1 x 40 ml 4 oz DISS METALS 1 liter		8 oz VOC (8260)	3 x 40 ml	4 oz
HVOC 8010		SVOC (8270)	1 liter	8 oz
1 1 10 10 10 10 10 10 10 10 10 10 10 10	:s	TOTAL METALS	1 liter	8 oz
VOC-BTEX 8020 / TDS 250 ml	0	4 oz DISS METALS	1 liter	
	8020	TDS	250 ml	
TSS 250 ml		TSS	250 ml	
TOC 500 ml 4		тос	500 ml	4 oz
TCLP 2 liters 2		TCLP	2 liters	2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: <u>08/24/93</u>			SAMPLE I	D: <u>LAY-SS</u>	07-SW01				
RADAR STATION: P									
SITE/AOC: POL Dra	inage SS07		FEET FRO	M FIXED P	OINT: <u>156</u>	N	MAGNETIC HE	ADING	S: <u>200.5°</u>
FIXED POINT: South	nwest corne	r of berm are	ound horiz	ontal tanks			· · · · · · · · · · · · · · · · · · ·		
SAMPLE MATRIX: [ment (SD)	■ 9	Surface Water (SW)		Groundwater (GW)	
SAMPLERS: <u>JP, DI</u>	١	· · · · · · · · · · · · · · · · · · ·							
TIME SAMPLED: 1									
SAMPLE DESCRIPTI	ON/COMMI	=NTS: Begii	nning or so	outh leacha	te stream. Same lot	alion	15 5001.		
SAMPLING METHOD): Grab								
QA/QC SAMPLES C	OLLECTED:	: 🗆 Equi	oment Blar	nk (EB)	☐ QA/QC Ext	ra Volu	umes		
☐ Trip Blank (TB)					ID				
☐ Ambient Condition	on Blank (Af	3) 🗌 Repli	cate of So	il Sample II					
			WA	TER PARA	METERS				
TIME	PH	C	ONDUCTIV	ΊΤΥ	TEMPERATURE	SPE	CIFIC GRAVIT	ΥT	URBIDITY
13:20	6.9	>	1,990 μS		6°C	1.00	1		
						<u> </u>			
	T		MON	ITORING P	EADINGS		Τ		
			00"	TI (01)	HANBY SCREEN	IING			
TIME	PID REAL	ING (ppm)	CG/LI	EL (%)	(standard/ppm)				
							l		
BG=Background;	BZ=Breath	ing Zone; B	H=Boreho	le; NR=No	Readings; HS=Hea	dspac	e; S=Sample (uncor	ntained)
			✓ CHECK	ANALYSE	S REQUESTED				
		В/	ARROW LA	AB			ANCHO	RAGE	LAB
ANALYSES	1	С	ONTAINEF	RS	ANALYSES	1	CON	TAINE	RS
		WAT	ER	SOIL			WATER		SOIL
ТРН	1	1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz
PCB					SVOC (8270)		1 liter		8 oz
PESTICIDES	į]			TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40 ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1				TDS		250 ml		
					TSS		250 ml		
					тос		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz
					1				

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

SAMPLE ID: LAY-SS07-SW02 RADAR STATION: Point Lay WEATHER: Sunny, 48°F SITE/AOC: POL Drainage SS07 FEET FROM FIXED POINT: 120 MAGNETIC HEADING: 214° FIXED POINT: Southwest corner of berm around horizontal tanks. SAMPLE MATRIX: Soil (S) Sediment (SD) Surface Water (SW) Groundwater (GW) SAMPLERS: JP, DN, JD TIME SAMPLED: 12:52 DEPTH OF SAMPLE (feet): SAMPLE DESCRIPTION/COMMENTS: Beginning of middle leachate stream. Same location as SD02. SAMPLING METHOD: Grab QA/QC SAMPLES COLLECTED: Equipment Blank (EB) QA/QC Extra Volumes Trip Blank (TB) Duplicate of Water Sample ID WATER PARAMETERS TIME PH CONDUCTIVITY TEMPERATURE SPECIFIC GRAVITY TURBIDITY 13:00 7.1 >1,990 µS 9°C 1.001
FIXED POINT: Southwest corner of berm around horizontal tanks. SAMPLE MATRIX: Soil (S) Sediment (SD) Surface Water (SW) Groundwater (GW) SAMPLERS: JP, DN, JD TIME SAMPLED: 12:52 DEPTH OF SAMPLE (feet): SAMPLE DESCRIPTION/COMMENTS: Beginning of middle leachate stream. Same location as SD02. SAMPLING METHOD: Grab QA/QC SAMPLES COLLECTED: Equipment Blank (EB) QA/QC Extra Volumes Trip Blank (TB) Duplicate of Water Sample ID Ambient Condition Blank (AB) Replicate of Soil Sample ID WATER PARAMETERS TIME PH CONDUCTIVITY TEMPERATURE SPECIFIC GRAVITY TURBIDITY
SAMPLE MATRIX: Soil (S) Sediment (SD) Surface Water (SW) Groundwater (GW) SAMPLERS: JP, DN, JD TIME SAMPLED: 12:52 DEPTH OF SAMPLE (feet): SAMPLE DESCRIPTION/COMMENTS: Beginning of middle leachate stream. Same location as SD02. SAMPLING METHOD: Grab QA/QC SAMPLES COLLECTED: Equipment Blank (EB) QA/QC Extra Volumes Trip Blank (TB) Duplicate of Water Sample ID Ambient Condition Blank (AB) Replicate of Soil Sample ID WATER PARAMETERS TIME PH CONDUCTIVITY TEMPERATURE SPECIFIC GRAVITY TURBIDITY
SAMPLERS: JP, DN, JD TIME SAMPLED: 12:52 DEPTH OF SAMPLE (feet): SAMPLE DESCRIPTION/COMMENTS: Beginning of middle leachate stream. Same location as SD02. SAMPLING METHOD: Grab QA/QC SAMPLES COLLECTED: Equipment Blank (EB) QA/QC Extra Volumes Trip Blank (TB) Duplicate of Water Sample ID Ambient Condition Blank (AB) Replicate of Soil Sample ID WATER PARAMETERS TIME PH CONDUCTIVITY TEMPERATURE SPECIFIC GRAVITY TURBIDITY
TIME SAMPLED: 12:52 DEPTH OF SAMPLE (feet):
SAMPLE DESCRIPTION/COMMENTS: Beginning of middle leachate stream. Same location as SD02. SAMPLING METHOD: Grab QA/QC SAMPLES COLLECTED:
SAMPLING METHOD: Grab QA/QC SAMPLES COLLECTED:
QA/QC SAMPLES COLLECTED:
QA/QC SAMPLES COLLECTED:
☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID
Ambient Condition Blank (AB) Replicate of Soil Sample ID
WATER PARAMETERS TIME PH CONDUCTIVITY TEMPERATURE SPECIFIC GRAVITY TURBIDITY
TIME PH CONDUCTIVITY TEMPERATURE SPECIFIC GRAVITY TURBIDITY
TIME FA CONDUCTIVITY TELEVISIONS OF SOME
13:00 7.1 >1,990 μS 9°C 1.001
MONITORING READINGS
HANBY SCREENING
TIME PID READING (ppm) CG/LEL (%) (standard/ppm)
BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)
✓ CHECK ANALYSES REQUESTED
BARROW LAB ANCHORAGE LAB
ANALYSES CONTAINERS ANALYSES CONTAINERS
WATER
TPH
PCB SVOC (8270) ✓ 1 liter 8 oz
PESTICIDES TOTAL METALS 1 liter 8 oz
HVOC 8010 1 x 40 ml 4 oz DISS METALS 1 liter
VOC-BTEX 8020 ✓ TDS ✓ 250 ml
TSS ✓ 250 ml
TOC ✓ 500 ml 4 oz
TCLP 2 liters 2 x 8 o

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonety=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS Radar Station Codes:

DATE: <u>08/24/93</u>			_SAMPL	E ID: LAY-S	S07-SW03				
RADAR STATION: PO	oint Lay		_WEATH	HER:					
SITE/AOC: POL Drain	nage SS07		_ FEET F	ROM FIXED	POINT: <u>159</u>		MAGNETIC H	EADIN	G: <u>231°</u>
FIXED POINT: South	west corner	r of berm	around h	orizontal tank	5.				
SAMPLE MATRIX:							Groundwater	•	
SAMPLERS:									
SAMPLERS:TIME SAMPLED:			DEPTH	I OF SAMPLE	(feet):				
SAMPLE DESCRIPTION	JN/COMME	:NIS: <u>Po</u>	ol at dott	om of north i	acnate stream. Sam	ie iocat	ion as SD03.		
SAMPLING METHOD	:								
QA/QC SAMPLES CO					☐ QA/QC Ex	tra Volu	umes		
		•	•	• •	e ID				
☐ Ambient Condition	n Blank (AE	3) 🗆 Rej	plicate of	Soil Sample	D				
				WATER PARA					
TIME	PH		CONDUC	TIVITY	TEMPERATURE	SPE	CIFIC GRAVIT	ΥT	URBIDITY
11:40	7.2		>1,990 μ	<u> </u>	6°C	1.00	1		
11.40	1.2		- 1,330 μ·			1.00	1	\dashv	
	<u> </u>								
			М	ONITORING	READINGS				
					HANBY SCREEN	IING			
TIME	PID READ	ING (ppm	i) CG	9/LEL (%)	(standard/ppm)				
			ļ						
BG-Background:	R7—Breath	ing Zone:	BH-Bor	ehole: NR-N	o Readings; HS=Hea	dspace	e: S=Sample (uncor	tained)
BG-Background,	BZ-BICALII	g 20110,				.aopao	o, o campio	(411001	
	1 1		✓ CHE	CK ANALYSI	S REQUESTED				
			BARROW	/ LAB			ANCHO	RAGE	LAB
ANALYSES			CONTAIN	NERS	ANALYSES	1	CON	TAINE	RS
		WA	ATER	SOIL			WATER		SOIL
TPH	1	1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz
РСВ					SVOC (8270)		1 liter		8 oz
PESTICIDES					TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40 m	nl	4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1				TDS		250 ml		
					TSS		250 ml		
					тос		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz
	TOLI E MOIS E A C								

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

SAMPLE COLLECTION LOGS FOR THE CRUSHED DRUM AREA (SS08)

DATE: <u>08/23/93</u>			SA	MPLE I	D: <u>LAY-SS</u> (08-S01-0.5				
	ADAR STATION: Point Lay WEATHER: Overcast, 48°F									
SITE/AOC: Crushed	Drum Area	SS08	FE	ET FRO	M FIXED P	OINT: <u>48</u>	M	AGNETIC HEA	ADING	: <u>0</u>
FIXED POINT: North										
SAMPLE MATRIX:	` '	□ S	edime	nt (SD)		Surface Water (SW)		Groundwater	(GW)	
SAMPLERS: <u>AP, DN</u> TIME SAMPLED: <u>12</u>			DE	PTH OF	SAMPLE	(fact): 6"				
SAMPLE DESCRIPTION	ON/COMME	NTS: A	DL	h of culv	vert. Sandv	gravel, 50% gravel	to 1/2-i	nch. 10% fines	s. loose	e, saturated,
strong diesel odor ar										
SAMPLING METHOD										-
QA/QC SAMPLES CO	OLLECTED:		quipm	ent Blan	ık (EB)	☐ QA/QC Ext	ra Volu	ımes		
☐ Trip Blank (TB)			uplicat	e of Wa	ter Sample	ID				
Ambient Condition	n Blank (AE	3) 🗆 R	eplicat	e of Soi	I Sample ID)				
				WAT	TER PARAN	METERS				
TIME	PH		CON	DUCTIV	IΤΥ	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY
			· · · · · · · · · · · · · · · · · · ·							
							 		T	
				MON	ITORING R	EADINGS				
						HANBY SCREEN	IING			
TIME	PID READ	ING (pp	m)	CG/LE	L (%)	(standard/ppm)				
12:55	464 BH									
BG=Background;	BZ=Breath	ing Zone	; BH=	Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncor	ntained)
			/	CHECK	ANALYSES	S REQUESTED				
			BAR	ROW LA	ΔB			ANCHO	RAGE	LAB
ANALYSES			CON	TAINER	s	ANALYSES	1	CON	TAINE	RS
		W	VATER		SOIL			WATER		SOIL
TPH	1	1 liter	· · · · · · · · ·		8 oz	VOC (8260)		3 x 40 ml		4 oz
PCB	1					SVOC (8270)		1 liter		8 oz
PESTICIDES	1					TOTAL METALS		1 liter		8 oz
HVOC 8010	1	1 x 40	mi		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1					TDS		250 ml		
						TSS		250 ml		
						тос		500 ml		4 oz
						TCLP		2 liters		2 x 8 oz
		1								

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>08/23/93</u>				D: <u>Lay-ss</u>						
RADAR STATION: Point Lay WEATHER: Overcast, 48°F SITE/AOC: Crushed Drum Area SS08 FEET FROM FIXED POINT: 126 MAGNETIC HEADING: 15°										
SITE/AOC: Crushed	Drum Area	SS08	FEET FRO	M FIXED P	OINT: <u>126</u>	!	MAGNETIC HE	EADING	3: <u>15°</u>	
FIXED POINT: North										
SAMPLE MATRIX: SAMPLERS: AP, DN		☐ Sedin	nent (SD)		Surface Water (SW)		Groundwater	(GW)		
TIME SAMPLED: <u>11</u>			DEPTH O	F SAMPLE	(feet): 2					
SAMPLE DESCRIPTION						el to 1/2	2-inch, minor f	ines, la	oose, moist,	
gray-brown sands.	511,00111111									
SAMPLING METHOD	: Soil auge	er - grab								
QA/QC SAMPLES CO			ment Blar	nk (EB)	☐ QA/QC Ex	ra Volu	ımes			
☐ Trip Blank (TB)					ID					
☐ Ambient Condition	n Blank (AE	•								
				TER PARAM		<u> </u>		- King		
TIME	PH	cc	NDUCTIV	/ITY	TEMPERATURE	SPE	CIFIC GRAVIT	ΥT	URBIDITY	
			MON	IITORING R	EADINGS					
TIME	PID READ	iNG (ppm)	CG/LE	EL (%)	HANBY SCREEN (standard/ppm)	IING				
11:55	0 \$			····						
BG=Background;	BZ=Breath	ing Zone; Bl	Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample ((uncor	tained)	
			✓ CHECK	ANALYSES	S REQUESTED					
		BA	RROW LA	∖ B			ANCHO	RAGE	LAB	
ANALYSES		C	ONTAINER	RS	ANALYSES		CON	TAINE	RS	
		WAT	ER	SOIL			WATER		SOIL	
TPH	1	1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz	
PCB	1				SVOC (8270)		1 liter		8 oz	
PESTICIDES					TOTAL METALS		1 liter		8 oz	
HVOC 8010	1	1 x 40 ml		4 oz	DISS METALS		1 liter			
VOC-BTEX 8020	/				TDS		250 ml			
			···.		TSS		250 ml			
					тос		500 ml		4 oz	
					TCLP		2 liters		2 x 8 oz	

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: <u>08/23/93</u>			SAN	MPLE I	D: <u>Lay-ss</u>	08-S03-2				
RADAR STATION: Po										
SITE/AOC: Crushed	Drum Area	SS08	_ FEE	T FRO	M FIXED P	OINT: <u>165</u>		MAGNETIC HE	EADIN	G: <u>3°</u>
FIXED POINT: North	east corner	of modu	le train							
SAMPLE MATRIX:	Soil (S)	☐ Se	edimen	rt (SD)		Surface Water (SW)		Groundwater	(GW)	
SAMPLERS: AP, DN										
TIME SAMPLED: 11								1.1-4/0.11-		
SAMPLE DESCRIPTION SAMPLE DESCRIPTION							, grave	i to 1/2-inch, i	oose,	moist, gray-
brown. Sampled dire SAMPLING METHOD			arit Ciay	/ encou	illeleu al I	1001.				
QA/QC SAMPLES CO			nuinme	ent Rian	k (EB)	□ OA/OC Ex	ra Voli	ımes		
						ID				
☐ Ambient Condition										
		· · · · · · · · · · · · · · · · · · ·	UNITED TO		ER PARAN					
TIME	РН		COND	DUCTIV	ITY	TEMPERATURE	SPE	CIFIC GRAVIT	γŢ	URBIDITY
111112	1		-	-		12111 2:311 3:12	10.2	010 0	` `	0.10.0
									_	
				MON	TORING R	EADINGS				
			T			HANBY SCREEN	IING			
TIME	PID READ	ING (ppr	n)	CG/LE	L (%)	(standard/ppm)				
11:40	0 S				•		•			
PG-Packground:	B7—Brooth	ina Zana	. pu_c	Porobol	o: NP-No	Readings; HS=Hea	depac	r: C-Campla	(uncor	rtained)
BG=Background,	DZ=DI V alii	ing zone,	, bn=t	DOIGITO	e, inn=ino	neadings, no=nea	uspaci	s, 3=3ample	(unicon	itained)
			√ (CHECK	ANALYSES	REQUESTED				
			BARR	OW LA	В			ANCHO	RAGE	LAB
ANALYSES			CONT	TAINER:	S	ANALYSES	/	CON	TAINE	RS
		w	ATER		SOIL			WATER		SOIL
TPH	1	1 liter			8 oz	VOC (8260)		3 x 40 ml		4 oz
PCB	1			i		SVOC (8270)		1 liter		8 oz
PESTICIDES						TOTAL METALS		1 liter		8 oz
	1		mi		4 oz	DISS METALS	-	1 liter		
HVOC 8010	1	l 1 x 40 i	1 I I I							
HVOC 8010 VOC-BTEX 8020	1	1 x 40				TDS		250 ml		
HVOC 8010 VOC-BTEX 8020	1	1 x 40				TDS		250 ml		
li .		1 x 40						 		 4 oz
li .		1 x 40				TSS		250 ml		

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>08/23/93</u>										
RADAR STATION: <u>P</u>	oint Lay		WE	EATHER	: Overcast	. 48°F				
SITE/AOC: Crushed				ET FRO	M FIXED PO	DINT: <u>186</u>	MAG	NETIC HEADIN	NG: <u>34</u>	
POINT: Northeast co										SAMPLE
MATRIX: 📰 Soil (S)			•] Surface W	/ater (SW)	roundw	rater (GW)		
SAMPLERS: AP, DI				DTU OF	CAMPLE	(5-at). CII				
TIME SAMPLED: <u>11</u> SAMPLE DESCRIPTION	1:30 ON/COMME	NITO: N	DE	:PIH OF	· SAMPLE ((1881): <u>6"</u> Sandy gravel to 1 in	ch sar	ndy minor fine	s orga	nics. loose.
saturated, gray-browi						Sandy graver to 1 m	on, car	ioy, minor mio	<u>0, 0.9</u>	
SAMPLING METHOD				at water	tuoio.					
QA/QC SAMPLES C				ent Blan	ık (EB)	☐ QA/QC Ext	ra Volu	ımes		
☐ Trip Blank (TB)						ID				
☐ Ambient Condition	n Blank (AE	3) 🗆 F	teplicat	e of Soi	I Sample ID					
				WAT	TER PARAN	METERS				
TIME	PH		CON	DUCTIV	ITY	TEMPERATURE	SPE	CIFIC GRAVIT	ΥT	URBIDITY
THAIL							ļ			
	_						<u> </u>		+	
								<u> </u>	_	
				MON	ITORING R	EADINGS				
						HANBY SCREEN	iing			
TIME	PID READ	ING (pp	m)	CG/LE	EL (%)	(standard/ppm)				
11:30	0.8									
DC. Beeksteind	P7—Prooth	ina Zone	. BU_	Roreho	le: NR-No	Readings; HS=Hea	dspace	e: S=Sample	(uncor	tained)
BG=Background,	DZ=DIeatii	ing zone								
				CHECK	ANALYSES	REQUESTED		····	-	
			BARI	ROW LA	λB			ANCHO	PRAGE	LAB
ANALYSES			CON	ITAINER	s	ANALYSES	1	CON	TAINE	RS
		V	VATER		SOIL			WATER		SOIL
ТРН	1,	1 liter		-	8 oz	VOC (8260)		3 x 40 ml		4 oz
РСВ	1					SVOC (8270)		1 liter		8 oz
PESTICIDES	-					TOTAL METALS		1 liter		8 oz
HVOC 8010	1,	1 x 40	ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1			ł		TDS		250 ml	<u> </u>	
						TSS		250 ml		
						тос		500 ml		4 oz
						TCLP		2 liters		2 x 8 oz
		_								
II		į.			1	L	1	L		

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: <u>08/23/93</u>			SAM	IPLE I	D: LAY-SS	08-S05-2				
RADAR STATION: P	oint Lay		WEA	ATHER	Overcast	, 48°F				
SITE/AOC: Crushed							١	MAGNETIC HE	ADING	3: <u>346°</u>
FIXED POINT: North	east corner	of modul	e train.							
SAMPLE MATRIX:	Soil (S)	☐ Se	diment	t (SD)		Surface Water (SW)		Groundwater (GW)	
SAMPLERS: <u>AP, DI</u>										,
TIME SAMPLED: 11									10.000	
SAMPLE DESCRIPTI soils. Sampled direct				ircular	depression	i. Sandy gravei to	inch,	sandy, 100se, c	jamp,	gray-brown
SAMPLING METHOD			pour.							
QA/QC SAMPLES C			uipme	nt Blan	k (EB)	☐ QA/QC Ex	tra Volu	umes		
☐ Trip Blank (TB)										
				cate of Soil Sample ID						
	, · · · · · · · ·			***	ER PARAI	1-400				
TIME	PH		COND	UCTIV	ΤΥ	TEMPERATURE	SPE	CIFIC GRAVIT	γT	URBIDITY
				MONI	TODING D	LADINGS				
				MON	TORING R				I	
TIME	PID READ	ING (ppm	1)	CG/LE	L (%)	HANBY SCREEN (standard/ppm)	IING			•
11:30	08									
BG=Background;	BZ=Breath	ing Zone;	BH=E	Borehol	e; NR=No	Readings; HS=Hea	dspac	e; S=Sample (uncor	ntained)
			√ C	HECK	ANALYSE	S REQUESTED				-
			BARR	OW LA	В			ANCHO	RAGE	LAB
ANALYSES	1		CONT	AINER	S	ANALYSES	1	CON	TAINE	RS
		W	ATER		SOIL			WATER		SOIL
TPH	1	1 liter			8 oz	VOC (8260)		3 x 40 ml		4 oz
РСВ	1					SVOC (8270)		1 liter		8 oz
PESTICIDES						TOTAL METALS		1 liter		8 oz
HVOC 8010	1	1 x 40 n	nl	i	4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1					TDS		250 ml		
						TSS		250 ml		
						тос		500 ml		4 oz
						TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCI to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>08/23/93</u>			SA	MPLE ![D: <u>LAY-SSC</u>	08-S06-0.5				
RADAR STATION: Point Lay WEATHER: Overcast, 50°F SITE/AOC: Crushed Drum Area SS08 FEET FROM FIXED POINT: 114 MAGNETIC HEADING: 26.5°										
					M FIXED P	OINT: 114		MAGNETIC HE	ADING	3: <u>26.5°</u>
FIXED POINT: North										
SAMPLE MATRIX:				nt (SD)	□s	Surface Water (SW)		Groundwater (GW)	
SAMPLERS: <u>AP, DN</u> TIME SAMPLED: <u>13</u>	·15		DE	PTH OF	SAMPLE (feet): 7"			-	
SAMPLE DESCRIPTION	ON/COMME	NTS: At	flat are	ea at ter	minus of dit	ch. Gravelly sand,	50% sa	nd, gravel to 1/	2-inch	, 10% fines.
Loose, saturated, dar										
SAMPLING METHOD										
QA/QC SAMPLES CO	OLLECTED:	□E	quipmo	ent Blan	k (EB)	☐ QA/QC Ext	ra Volu	ımes		
☐ Trip Blank (TB)						ID				
Ambient Conditio	n Blank (AE	s) 🗆 R	eplicat	e of Soi	I Sample ID)				
				WAT	ER PARAM	METERS				
TIME	PH		CONI	DUCTIV	ITY	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY
									\top	
	_									
		_								1
				MON	ITORING R	EADINGS				
						HANBY SCREEN	IING			
TIME	PID READ	ING (pp	m)	CG/LE	L (%)	(standard/ppm)				
13:15	1,434 BH									
										-
BG=Background:	BZ=Breath	ing Zone	 ; BH=	Borehol	e; NR=No	Readings; HS=Hea	dspace	e; S=Sample (uncon	tained)
3						REQUESTED				
				ROW LA				ANCHO	RAGE	LAB
						ANALYOFO		CON	TAINE	RS
ANALYSES				TAINER		ANALYSES	/			
		V	VATER		SOIL			WATER		SOIL
TPH	1	1 liter			8 oz	VOC (8260)	/	3 x 40 ml		4 oz
РСВ	1					SVOC (8270)	1	1 liter		8 oz
PESTICIDES						TOTAL METALS	1	1 liter		8 oz
HVOC 8010	1	1 x 40	ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1					TDS		250 ml		
						TSS		250 ml		
						тос		500 ml		4 oz
						TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: <u>08/23/93</u>		SA	MPLE !	D: <u>LAY-SS</u>	08-\$07-0.5					
	ADAR STATION: Point Lay WEATHER: Overcast, 48°F									
SITE/AOC: Crushed	Drum Area	SS08 FE	ET FRO	M FIXED P	OINT: <u>48</u>	v	IAGNETIC HEA	DING	:	
FIXED POINT: North										
SAMPLE MATRIX:	Soil (S)	☐ Sedime	nt (SD)		Surface Water (SW)		Groundwater (0	GW)		
SAMPLERS: <u>AP, DI</u>										
TIME SAMPLED: 12							——————————————————————————————————————			
SAMPLE DESCRIPTION	ON/COMME	NTS: At mout	h of culv	ert. Sandy	gravel, 50% gravel to	1/2-in	ch. 10% fines.	Loos	e, saturated,	
gray.										
SAMPLING METHOD										
	OLLECTED:		ipment Blank (EB)							
☐ Trip Blank (TB)		•		•						
☐ Ambient Conditio	n Blank (AE	B) Replica	te of So	il Sample II) <u>LAY-SS08-S01</u>					
			WA	TER PARA	METERS					
TIME	PH	CON	IDUCTIV	'ITY	TEMPERATURE	SPE	CIFIC GRAVITY	' T	URBIDITY	
						 		_	· · · · · · · · · · · · · · · · · · ·	
	<u> </u>							-		
	ļ					İ				
			MON	IITORING R	EADINGS					
					HANBY SCREEN	IING				
TIME	PID READ	ING (ppm)	CG/LE	EL (%)	(standard/ppm)					
12:55	464 BH		ļ. *							
								1	***	
			<u></u>							
BG=Background;	BZ=Breath	ing Zone; BH=	=Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample (u	Incor	itained)	
		✓	CHECK	ANALYSE	S REQUESTED					
		BAR	ROW LA	AB			ANCHO	RAGE	LAB	
ANALYSES	/	CON	ITAINEF	RS	ANALYSES	1	CONT	AINE	RS	
		WATER	₹	SOIL			WATER		SOIL	
TPH	1	1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz	
РСВ	1				SVOC (8270)		1 liter		8 oz	
PESTICIDES	1				TOTAL METALS		1 liter		8 oz	
HVOC 8010	1	1 x 40 ml		4 oz	DISS METALS		1 liter			
VOC-BTEX 8020	1			 - 	TDS		250 ml			
					TSS		250 ml			
					тос		500 ml		4 oz	
					TCLP		2 liters		2 x 8 oz	

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>09/07/93</u>			SAM	PLE ID	: LAY-SS	08-2\$085				
RADAR STATION: P	RADAR STATION: Point Lay WEATHER: Overcast, windy, 32°F SITE/AOC: Crushed Drum Area SS08 FEET FROM FIXED POINT: MAGNETIC HEADING:									
SITE/AOC: Crushed	Drum Area	SS08	_ FEET	T FROI	M FIXED P	OINT:	M/	AGNETIC HEAI	DING:	
FIXED POINT: Unde									CIVO	
SAMPLE MATRIX:			aiment	(SD)	LIS	Surface Water (SW)	Ц	Groundwater (GVV)	
SAMPLERS: <u>AP, RC</u> TIME SAMPLED: <u>14</u>	.:35		DEP.	TH OF	SAMPLE	(feet): 0.5				
SAMPLE DESCRIPTION	ON/COMME	NTS: W	et sand	y grav	el, fine to c	coarse sand, 1/2 to	i inch	gravel, sheen, s	strong	odor.
				,						
SAMPLING METHOD										
QA/QC SAMPLES CO										
☐ Trip Blank (TB) ☐ Ambient Conditio						ID				
Ambient Conditio	II DIAIIK (AL	9) LI NO	Pilicate		****					
					ER PARAN		1		, _	IDDIDITA/
TIME	PH		CONDUCTIVITY			TEMPERATURE	SPE	CIFIC GRAVITY		URBIDITY
							ļ		_	
BG=0				MONI	TORING R	FADINGS				
BG=0		· · · · · · · ·		WON	TOTAL	HANBY SCREEN	IING		- I	
TIME	PID READ	ING (ppn	n) (CG/LE	L (%)	(standard/ppm)	iiiva			
14:40	HS = 4									
PG-Rackground:	R7-Breath	ing Zone:	BH=B	orehol	e: NR=No	Readings; HS=Hea	dspace	e: S=Sample (uncor	tained)
Ba-background,	DZ-Dieam	ing Zono,								
	T					REQUESTED		****		1.40
			BARRO	OW LA	3			ANCHO		
ANALYSES	1		CONT	AINER	S	ANALYSES	1	CONT	AINE	RS
		W	ATER		SOIL			WATER		SOIL
TPH		1 liter			8 oz	VOC (8260)		3 x 40 ml		4 oz
PCB						SVOC (8270)		1 liter		8 oz
PESTICIDES						TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40 r	ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1					TDS		250 ml		
VPH	1					TSS		250 ml		
EPH	1					тос		500 ml		4 oz
						TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: <u>09/07/93</u>		s	AMPLE I	D: <u>LAY-SS</u> (08-28095				
ADAR STATION: Point Lay WEATHER: Overcast, windy, 35°F									
SITE/AOC: Crushed	Drum Area	<u>SS08</u> F	EET FRO	M FIXED P	OINT:	M	AGNETIC HEA	DING:	
FIXED POINT: Unde	r module tr	ain, 66 feet fr	om east	end, 9 feet t	from south end.				
SAMPLE MATRIX:	Soil (S)	☐ Sedim	ent (SD)		Surface Water (SW)		Groundwater	(GW)	
SAMPLERS: <u>JP, SF</u>									
TIME SAMPLED: 14									
SAMPLE DESCRIPTION	ON/COMME	ENTS: Wet s	andy grav	vel, fine to c	oarse sand, 1/2 to	l inch o	gravel.		
SAMPLING METHOD		– – .							
QA/QC SAMPLES CO	OLLECTED:				☐ QA/QC Ex				
☐ Trip Blank (TB)	- Diami- /AF				ID				
Ambient Conditio	n Blank (At	s) Li Replic	ate of So	ii Sampie iL					
			WA	TER PARAM	METERS				
TIME	PH	co	NDUCTIV	'ITY	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY
			MON	IITORING R	EADINGS				
					HANBY SCREEN	IING		П	
TIME	PID READ	ING (ppm)	CG/LE	EL (%)	(standard/ppm)	inta			
14:40	HS = 97	***				************			
14.40	110 = 37		-						
		·	<u> </u>						
BG=Background;	BZ=Breath	ing Zone; BH	=Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncor	tained)
			CHECK	ANALYSES	REQUESTED				
		DAI	DOM L	\ D			ANCHO		LAR
		DAI	RROW LA	AD			ANOTIC	INAGE	LAD
ANALYSES	1	CO	NTAINEF	RS	ANALYSES	1	CON	TAINE	RS
		WATE	R	SOIL			WATER		SOIL
TPH		1 liter		8 oz	VOC (8260)		3 x 40 ml		4 oz
PCB		:			SVOC (8270)		1 liter		8 oz
PESTICIDES					TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40 ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1				TDS		250 ml		
VPH	1				TSS		250 ml		
EPH	1				тос		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>09/07/93</u>			SAM	APLE ID	: <u>LAY-SSC</u>	08-2S10-1				
RADAR STATION: Point Lay WEATHER: Overcast, windy, 32°F										
SITE/AOC: Crushed								AGNETIC HEA	DING:	
FIXED POINT: In dito										
SAMPLE MATRIX:	Soil (S)	☐ Se	diment	t (SD)		Surface Water (SW)		Groundwater	(GW)	
SAMPLERS: <u>JP</u>										
TIME SAMPLED: 14							l inch	arayal sama a	raania	e trace eilt
SAMPLE DESCRIPTION	ON/COMME	ENIS: We	et sanc	ay grav	ei, tine to c	coarse sand, 1/8 to	i inch	graver, Some C	луатт	S, trace siit.
SAMPLING METHOD	· Grab									
QA/QC SAMPLES CO		□ Fo	uinme	nt Blan	k (FB)	□ QA/QC Ex	ra Volu	ımes		
Trip Blank (TB)	JEELOTED.					ID				
☐ Ambient Condition	n Blank (AE									
	1				ER PARAN		T		. [_	
TIME	PH		COND	UCTIVI	TY	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY
						_				
							1			
BG=0				MONI	TORING R	EADINGS		· ·		
						HANBY SCREEN	IING		ļ	
TIME	PID READ	ING (ppm	n)	CG/LE	L (%)	(standard/ppm)				
14:45	HS = 60									
			- 1							
DO Destruction	DZ Dromb	ine Zana:		Porobol	o: NP-No	Readings; HS=Hea	denaci	s: S=Sample :	uncor	ntained)
BG=Background;	BZ=Breath	ing zone,	DH=C	SOLETION	e, NA=NO	Neadings, 110-11ec	aspaol	5, 0=0amp.c	aneer	
			√ 0	CHECK	ANALYSES	REQUESTED				
			BARR	OW LA	В			ANCHO	RAGE	LAB
			CONT	AINICO		ANIALVOTO	1	CON	TAINE	RS
ANALYSES			CONT	AINER		ANALYSES	,			
		W	ATER		SOIL			WATER	-	SOIL
ТРН		1 liter			8 oz	VOC (8260)		3 x 40 ml		4 oz
РСВ						SVOC (8270)		1 liter		8 oz
PESTICIDES						TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40 r	mı		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1					TDS		250 ml		
VPH	1					TSS		250 ml		
EPH	1					тос		500 ml		4 oz
						TCLP		2 liters		2 x 8 oz
11		L								

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: <u>09/07/93</u>		SA	MPLE I	D: <u>LAY-SS</u> C	08-2S11					
	ADAR STATION: Point Lay WEATHER: Overcast, windy, 32°F									
SITE/AOC: Crushed										
FIXED POINT: Next									r of garage	
SAMPLE MATRIX:	Soil (S)	☐ Sedime	nt (SD)	□s	Surface Water (SW)		Groundwater (0	GW)		
SAMPLERS: AP, JP										
TIME SAMPLED: 14	:45	DI	EPTH OF	SAMPLE ((feet):	-11 4-		1/0.1	inah arayal	
SAMPLE DESCRIPTION	ON/COMME	NTS: Wet sa	ndy grav	el, trace silt.	trace organics, me	alum to	coarse sano,	1/8-1	ıncı gravei.	
SAMPLING METHOD	Grab									
QA/QC SAMPLES CO		☐ Faujon	nent Blan	ık (EB)	☐ QA/QC Ext	ra Volu	ımes			
	, , , , , , , , , , , , , , , , , , , ,				ID					
☐ Ambient Conditio	n Blank (AE	3) 🗌 Replica	te of Soi	I Sample ID)				···	
				TER PARAN						
TIME	PH	CON	IDUCTIV	ITY	TEMPERATURE	SPE	CIFIC GRAVITY	TI	URBIDITY	
								<u> </u>		
								+		
	-							-		
			MON	ITORING R	EADINGS					
					HANBY SCREEN	IING				
TIME	PID READ	ING (ppm)	CG/LE	L (%)	(standard/ppm)			-		
BG=Background;	BZ=Breath	ing Zone; BH:	=Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample (ı	uncon	tained)	
		/	CHECK	ANALYSES	REQUESTED					
		BAF	ROW LA	\B			ANCHO	RAGE	LAB	
ANALYSES	1	COI	NTAINER	ıs	ANALYSES	1	CONT	AINE	RS	
		WATE	٦	SOIL			WATER		SOIL	
трн		1 liter		8 oz	VOC (8260)	1	3 x 40 mi		4 oz	
РСВ				i	SVOC (8270)	1	1 liter		8 oz	
PESTICIDES					TOTAL METALS		1 liter		8 oz	
HVOC 8010		1 x 40 ml		4 oz	DISS METALS		1 liter			
VOC-BTEX 8020	1				TDS		250 ml			
VPH	J				TSS		250 ml			
EPH	J				тос		500 ml		4 oz	
					TCLP		2 liters		2 x 8 oz	

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO $_3$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>09/07/93</u>	7/93 SAMPLE ID: <u>LAY-SS08-2S12-0.5</u>												
RADAR STATION: Poi	t Lay WEATHER: Westerly winds, 34°F rum Area SS08 FEET FROM FIXED POINT: MAGNETIC HEADING:												
SITE/AOC: <u>Crushed D</u>	rum Area S	SS08	FEE	T FROI	M FIXED PO	DINT:	MA	GNETIC HEAL	DING:				
FIXED POINT: <u>Under I</u>									0110				
SAMPLE MATRIX:				it (SD)	□s	urface Water (SW)	□ '	Groundwater (GW)				
SAMPLERS: <u>AP, JP</u> TIME SAMPLED: <u>15:</u> (DTI OF	CAMPLE (fact): 0 E							
TIME SAMPLED: <u>15:(</u> SAMPLE DESCRIPTIO					SAMPLE (1881). <u>0.5</u>							
SAMPLE DESCRIPTIO	IN/COMINIE	M13. <u>3</u>	ariuy y	iavei.									
SAMPLING METHOD:	Scoop an	d grab											
QA/QC SAMPLES CO			quipme	ent Blan	k (EB)	☐ QA/QC Ext	ra Volu	imes					
	☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID												
☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID													
WATER PARAMETERS													
TIME PH CONDUCTIVITY TEMPERATURE SPECIFIC GRAVITY TU								URBIDITY					
THVIC	1 1 1		00111										
							-		_				
MONITORING READINGS													
HANBY SCREENING													
TIME	PID READ	ING (pp	m)	CG/LE	L (%)	(standard/ppm)							
BG=Background; B	7 Droothi	na 7000		Porchoi	a: NR-No	Readings: HS=Hea	dspace	e: S=Sample (uncon	tained)			
BG=Background; E	SZ=Dream	ng zone											
			1	CHECK	ANALYSES	REQUESTED		-					
			BARF	ROW LA	В			ANCHO	RAGE	LAB			
ANALYSES			CONTAINERS			ANALYSES	1	CON	TAINE	RS			
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		W	VATER		SOIL			WATER		SOIL			
ТРН		1 liter			8 oz	VOC (8260)		3 x 40 ml		4 oz			
PCB		1 11101				SVOC (8270)		1 liter		8 oz			
PESTICIDES						TOTAL METALS		1 liter		8 oz			
HVOC 8010		1 x 40	ml		4 oz	DISS METALS		1 liter					
VOC-BTEX 8020	1	7 13				TDS		250 ml					
EPH	1			1		TSS		250 ml					
VPH	1					TOC		500 ml		4 oz			
			-			TCLP		2 liters		2 x 8 oz			

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

DATE: <u>09/07/93</u>			SA	MPLE I	D: LAY-SS	08-2S15					
RADAR STATION: Point Lay WEATHER: Overcast, windy, 32°F SITE/AOC: Crushed Drum Area SS08 FEET FROM FIXED POINT: MAGNETIC HEADING:											
FIXED POINT: 240.5										nd of site.	
SAMPLE MATRIX:	Soil (S)	□s	edime	nt (SD)		Surface Water (SW)		Groundwater (0	GW)		
SAMPLERS: AP, SF											
TIME SAMPLED: 14	1:50 ON/COMME	NTC. C	DE	PTH OF	SAMPLE	(feet):	2 to 1 is	ach gravel com	o oro	anice trace	
SAMPLE DESCRIPTION	ON/COMME	:N15: <u>-</u>	andy (graver, w	ret, mediun	1 to coarse sario, 1/2	2 10 1 11	ich glavel, som	ie org	ariics, irace	
SAMPLING METHOD): Grab		,								
QA/QC SAMPLES CO			quipm	ent Blar	ık (EB)	☐ QA/QC Ext	ra Volu	ımes			
					= =	ID					
☐ Ambient Conditio	n Blank (AE	3) 🔳 F	Replica	te of Soi	i Sample II	LAY-SS08-2S11					
				WA	TER PARAM	METERS					
TIME	PH		CON	DUCTIV	ITY	TEMPERATURE	SPE	CIFIC GRAVITY	' т	URBIDITY	
				MON	ITORING R	EADINGS					
HANBY SCREENING											
TIME	TIME PID READING (ppm) CG/LEL (%) (standard/ppm)										
BG=Background;	BZ=Breath	ing Zone	e; BH=	Boreho	le; NR=No	Readings; HS=Hea	dspac	e; S=Sample (u	ıncon	tained)	
			1	CHECK	ANALYSES	S REQUESTED					
			BAR	ROW LA	'B			ANCHO	RAGE	LAB	
ANALYSES	1		CON	ITAINER	S	ANALYSES	1	CONT	AINE	RS	
		V	VATER	l	SOIL			WATER		SOIL	
TPH		1 liter			8 oz	VOC (8260)	1	3 x 40 ml		4 oz	
РСВ						SVOC (8270)	1	1 liter		8 oz	
PESTICIDES						TOTAL METALS		1 liter		8 oz	
HVOC 8010	1 x 40 ml 4 oz DISS METALS 1 liter										
VOC-BTEX 8020	1					TDS		250 ml			
VPH						TSS		250 ml			
EPH	1					тос		500 ml		4 oz	
						TCLP		2 liters		2 x 8 oz	

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to $\mathrm{4^{\circ}C}$

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

ATE: 08/23/93 SAMPLE ID: LAY-SS08-SD01												
RADAR STATION: <u>Po</u>												
SITE/AOC: Crushed					M FIXED P	OINT: <u>132</u>	^	MAGNETIC HE	ADING	3: <u>24°</u>		
FIXED POINT: North												
SAMPLE MATRIX: [SAMPLERS: <u>AP, DN</u>		s	edimer	nt (SD)		Surface Water (SW)		Groundwater (GW)			
TIME SAMPLED: 13			DE	PTH OF	SAMPLE	(feet): 2						
	AMPLE DESCRIPTION/COMMENTS: In pond with sheen. Same location as SW01.											
SAMPLING METHOD												
QA/QC SAMPLES CO	DLLECTED:											
☐ Trip Blank (TB)	- 511 (45					ID						
Ambient Condition	n Blank (At	3) LI H	leplicat	e of So	i Sample II)				 1		
WATER PARAMETERS												
TIME	PH		CONI	DUCTIV	ITY	TEMPERATURE	SPE	CIFIC GRAVIT	/ T	URBIDITY		
MONITORING READINGS												
TIME	PID READING (ppm) CG/LEL (%) (standard/ppm)											
		iiva (pp	(Standard/ppm) CG/LEL (%) (Standard/ppm)									
13:30	541 HS								-			
PC - Background:	P7—Prooth	ing Zong		Rorobo	e: NP-No		dspace	s: S=Sample (uncor	ntained)		
BG=Background;	DZ=DIeain	ing zone					аэрас	s, o-campio (011001			
			V	CHECK	ANALYSES	REQUESTED						
			BARF	ROW LA	В			ANCHO	RAGE	LAB		
ANALYSES	1		CON	TAINER	S	ANALYSES	1	CON	TAINE	RS		
		M	VATER		SOIL			WATER		SOIL		
ТРН	1	1 liter			8 oz	VOC (8260)	1	3 x 40 ml		4 oz		
РСВ	1					SVOC (8270)	1	1 liter		8 oz		
PESTICIDES						TOTAL METALS	1	1 liter		8 oz		
HVOC 8010	1	1 x 40	ml		4 oz	DISS METALS		1 liter				
VOC-BTEX 8020	1					TDS		250 ml				
						TSS		250 ml				
						тос		500 ml		4 oz		
						TCLP		2 liters		2 x 8 oz		

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

ATE: 08/23/93 SAMPLE ID: LAY-SS08-SD02											
	Point Lay WEATHER: Overcast, very fine rain, 50°F Drum Area SS08 FEET FROM FIXED POINT: 50 MAGNETIC HEADING: 20°										
SITE/AOC: Crushed	Drum Area	SS08	FEI	ET FRO	M FIXED P	OINT: <u>50</u>		MAGNETIC H	EADIN	G: <u>20°</u>	
FIXED POINT: North											
SAMPLE MATRIX:] Soil (S)	■ S	edimer	nt (SD)	□s	Surface Water (SW)		Groundwater ((GW)		
SAMPLERS: AP, DN	<u> </u>										
TIME SAMPLED: 14									-		
SAMPLE DESCRIPTION	ON/COMME	NTS: <u>N</u>	larshy	area, dr	ainage from	n pond.					
CAMPLING METHOD	. Crob or	il accor						•			
SAMPLING METHOD				ant Dian	1. (ED)		ra Volu	ımas			
QA/QC SAMPLES CO						ID					
☐ Trip Blank (TB)	n Blank (AB										
☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID											
	1						T	0.510.004.45	, , ,	UDDIDITY	
TIME	PH		CONI	DUCTIV	ITY	TEMPERATURE	SPE	CIFIC GRAVIT	Y 1	URBIDITY	
MONITORING READINGS											
						HANBY SCREEN	IING				
TIME	PID READ	ING (pp	m)	CG/LE	L (%)	(standard/ppm)			- -		
									-		
BG=Background:	BZ=Breath	ina Zone	e: BH=	Borehol	e: NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncon	tained)	
BG-BGONG: CELLE		9				REQUESTED		•			
						REQUESTED		****		LAD	
			BAR	ROW LA	.B			ANCHORAG		LAB	
ANALYSES	1		CON	TAINER	S	ANALYSES	1	CON	TAINE	RS	
		٧	VATER		SOIL			WATER		SOIL	
ТРН	1	1 liter	· · · · · · · · · · · · · · · · · · ·		8 oz	VOC (8260)		3 x 40 ml		4 oz	
РСВ	1					SVOC (8270)		1 liter		8 oz	
PESTICIDES						TOTAL METALS		1 liter		8 oz	
HVOC 8010	1	1 x 40	ml		4 oz	DISS METALS		1 liter			
VOC-BTEX 8020	1					TDS		250 ml		***	
						TSS		250 ml		•••	
						тос		500 ml		4 oz	
						TCLP		2 liters		2 x 8 oz	
]			

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>08/23/93</u>					D: <u>Lay-ss</u>						
ADAR STATION: Point Lay WEATHER: Overcast, very fine rain, 50°F											
SITE/AOC: Crushed	TE/AOC: Crushed Drum Area SS08 FEET FROM FIXED POINT: 213 MAGNETIC HEADING: 36.5° (ED POINT: Northeast corner of module train.										
SAMPLE MATRIX:		■ S	edimer	nt (SD)		Surface Water (SW)		Groundwater	(GW)		
SAMPLERS: <u>AP, DN</u> TIME SAMPLED: <u>14</u>	· 00			מרש הני	CAMDIE	(fact): 1"					
SAMPLE DESCRIPTION							ation a	s SW02.			
SAMIFLE DESCRIPTION	O14/OOIVIIVIL		tt Junion	ion or a	ramages ne	m porta. Came tec					
SAMPLING METHOD											
QA/QC SAMPLES CO	OLLECTED:										
☐ Trip Blank (TB)						ID					
☐ Ambient Condition	n Blank (AE	3) 🗆 F	Replicat	e of Soi	il Sample II)					
				WA	TER PARAN	METERS					
TIME	PH		CONI	DUCTIV	ITY	TEMPERATURE	SPE	CIFIC GRAVIT	ΥT	URBIDITY	
				MON	ITORING R	EADINGS					
HANBY SCREENING											
TIME	PID READ	(standard/ppm)									
BG=Background;	BZ=Breath	ing Zone	э; ВН=	Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncor	tained)	
			1	CHECK	ANALYSES	REQUESTED					
			BARF	ROW LA	.Β			ANCHO	RAGE	LAB	
ANALYSES	1		CON	TAINER	S	ANALYSES	1	CON	TAINE	RS	
		V	VATER		SOIL			WATER		SOIL	
TPH	1	1 liter			8 oz	VOC (8260)		3 x 40 ml		4 oz	
РСВ	1					SVOC (8270)		1 liter		8 oz	
PESTICIDES					<u> </u>	TOTAL METALS		1 liter		8 oz	
HVOC 8010	1	1 x 40	ml		4 oz	DISS METALS		1 liter			
VOC-BTEX 8020				TDS		250 ml					
						TSS		250 ml			
						тос		500 ml		4 oz	
						TCLP		2 liters		2 x 8 oz	

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; Ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>08/24/93</u>		s/	AMPLE II	D: <u>LAY-SS</u> (08-SW01						
RADAR STATION: Point Lay WEATHER: Sunny, 48°F											
SITE/AOC: Crushed	ITE/AOC: Crushed Drum Area SS08 FEET FROM FIXED POINT: 132 MAGNETIC HEADING: 24° IXED POINT: Northeast corner of module train.										
FIXED POINT: North	east corner	of module tra	in.			·					
SAMPLE MATRIX:] Soil (S)	☐ Sedime	ent (SD)	S	Surface Water (SW)		Groundwater (GW)			
SAMPLERS: JP, DN		A					· · · · · · · · · · · · · · · · · · ·				
TIME SAMPLED: 11	:00	D	EPTH OF	SAMPLE	(feet):						
SAMPLE DESCRIPTION	ON/COMME	ENTS: Sample	was co	llected in a	pond. A sheen is v	risible.					
SAMPLING METHOD: Grab											
QA/QC SAMPLES COLLECTED: Equipment Blank (EB) QA/QC Extra Volumes											
☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID											
Ambient Condition Blank (AB) Replicate of Soil Sample ID											
	WATER PARAMETERS										
TIME	PH	CON	IDUCTIV	ΊΤΥ	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY		
11:00	7.1	580			10°C	1.00	0				
								_			
MONITORING READINGS											
HANBY SCREENING											
TIME	PID READ	ING (ppm)	CG/LE	EL (%)	(standard/ppm)						
								<u> </u>			
BG=Background;	BZ=Breath	ing Zone; BH:	=Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample (uncor	tained)		
			CHECK	ANALYSES	REQUESTED						
		BAF	ROW LA	 \В			ANCHO	RAGE	LAB		
ANIAL VOEC		COL	NTAINER		ANALVEEC		CON	TAINE	RS.		
ANALYSES					ANALYSES	/		., 12			
		WATE	-	SOIL			WATER		SOIL		
TPH	/	1 liter		8 oz	VOC (8260)	1	3 x 40 ml		4 oz		
PCB	1				SVOC (8270)	1	1 liter		8 oz		
PESTICIDES					TOTAL METALS	1	1 liter		8 oz		
HVOC 8010	1	1 x 40 ml		4 oz	DISS METALS	1	1 liter		***		
VOC-BTEX 8020	1				TDS	1	250 ml				
			•		TSS	1	250 ml				
			тос	1	500 ml		4 oz				
					TCLP		2 liters		2 x 8 oz		

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>08/24/93</u>												
RADAR STATION: <u>Po</u>	ON: Point Lay WEATHER: Sunny, 48°F rushed Drum Area SS08 FEET FROM FIXED POINT: 213 MAGNETIC HEADING: 36.5°											
					M FIXED P	OINT: <u>213</u>	\	MAGNETIC HE	ADING	36.5°		
FIXED POINT: Northe												
SAMPLE MATRIX: SAMPLERS: JP, DN				t (SD)	S	urface Water (SW)		Groundwater (GW)			
TIME SAMPLED: 11:	15		DEI	PTH OF	SAMPLE (feet):						
SAMPLE DESCRIPTIO	N/COMME	NTS: A	t junction	on of dr	ainages fro	m pond. Same loc	ation a	s SD03.				
		-										
SAMPLING METHOD:												
QA/QC SAMPLES CO	LLECTED:		quipme	ent Blan	k (EB)	☐ QA/QC Ext	ra Volu	imes				
☐ Trip Blank (TB)						ID						
☐ Ambient Condition	Blank (AB) R	eplicate	of Soi	Sample ID)						
WATER PARAMETERS												
TIME		CONE	OUCTIVI	TY	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY			
11:15	7.3		520 μ	s		7°C						
MONITORING READINGS												
HANBY SCREENING												
TIME	PID READ	ING (pp	m)	CG/LE	L (%)	(standard/ppm)						
									_			
BG=Background; B	3Z=Breathi	ing Zone	e; BH=	Borehol	e; NR=No	Readings; HS=Hea	dspace	e; S=Sample (uncon	tained)		
			✓ (CHECK	ANALYSES	REQUESTED						
		-	BARF	ROW LA	В			ANCHO	RAGE	LAB		
ANALYSES			CON	TAINER	s	ANALYSES	1	CON	TAINE	RS		
		٧	VATER		SOIL			WATER		SOIL		
TPH	1	1 liter			8 oz	VOC (8260)		3 x 40 ml		4 oz		
РСВ	1					SVOC (8270)		1 liter		8 oz		
PESTICIDES						TOTAL METALS		1 liter		8 oz		
HVOC 8010	1	1 x 40	ml		4 oz	DISS METALS		1 liter				
VOC-BTEX 8020	1					TDS		250 ml				
						TSS		250 ml				
						тос		500 ml		4 oz		
						TCLP		2 liters		2 x 8 oz		
									·* · · · · · · · · · · · · · · · · · ·			

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

SAMPLE COLLECTION LOGS FOR BACKGROUND (BKGD)

DATE: <u>08/23/93</u>	SAMPLE ID: <u>LAY-BKGD-S01</u>											
		t Lay WEATHER: Overcast, slight breeze, 50°F										
SITE/AOC: BKGD			FEI	ET FRO	M FIXED P	OINT:	MA	GNETIC HEAD	ING:			
FIXED POINT: 222° 1	to southeas	t corner	of han	gar, 276	o to top of	radome, 282° to so	utheas	t corner of ma	n buil	ding train.		
SAMPLE MATRIX:	Soil (S)	□ se	edimer	nt (SD)	□s	urface Water (SW)		Groundwater (GW)			
SAMPLERS: SS, RC)											
_TIME SAMPLED: _1	4:40		DE	PTH OF	SAMPLE (feet): <u>0-0.5</u>						
SAMPLE DESCRIPTION	ON/COMME	NTS: C	layey s	silt, dark	brown-bro	wn, moderate orgar	ic mate	erial, firm, mois	it.			
SAMPLING METHOD	: Hand sco	oop										
QA/QC SAMPLES CO	DLLECTED:		quipme	ent Blan	k (EB)	☐ QA/QC Ext	ra Volu	imes				
☐ Trip Blank (TB)			uplicat	e of Wa	ter Sample	ID						
☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID												
WATER PARAMETERS												
TIME PH CONDUCTIVITY TEMPERATURE SPECIFIC GRAVITY TURBIDIT										JRBIDITY		
								-				
	- 						<u> </u>					
MONITORING READINGS												
HANBY SCREENING												
TIME	PID READ	ING (pp	m)	CG/LE	L (%)	(standard/ppm)						
									1-			
				•								
BG=Background;	BZ=Breath	ing Zone	; BH=	Borehol	e; NR=No	Readings; HS=Hea	dspace	e; S=Sample (uncon	tained)		
			1	CHECK	ANALYSES	REQUESTED						
			BARE	ROW LA	В			ANCHO	RAGE	LAB		
ANIALVOEC				TAINER		ANALYSES	1	CON	TAINE	 RS		
ANALYSES	/	1.0			SOIL	ANALISES		WATER		SOIL		
			VATER	!		VOC (0000)						
TPH	/	1 liter			8 oz	VOC (8260)	1	3 x 40 ml		4 oz		
PCB	1					SVOC (8270)	1	1 liter		8 oz		
PESTICIDES						TOTAL METALS	1	1 liter		8 oz		
HVOC 8010	1	1 x 40	mi		4 oz	DISS METALS		1 liter				
VOC-BTEX 8020	1					TDS		250 ml				
						TSS		250 ml				
						тос	1	500 ml		4 oz		
						TCLP		2 liters		2 x 8 oz		
}												

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>08/23/93</u>			SA	MPLE I	D: <u>LAY-BK</u>	GD-S02					
RADAR STATION: Point Lay WEATHER: Overcast, breezy, 50°F											
SITE/AOC: BKGD FEET FROM FIXED POINT: MAGNETIC HEADING: SIXED POINT: 224° to southeast corner of hangar, 295° to top of radome, 299° to southeast corner of main building train.											
FIXED POINT: 224° t	o southeas	t corner	of han	gar, 295	5° to top of	radome, 299° to so	outheas	t corner of m	<u>ain bui</u>	ding train.	
SAMPLE MATRIX:		□ S	edimer	nt (SD)		Surface Water (SW)		Groundwater	(GW)		
SAMPLERS: SS, RC						<u> </u>					
TIME SAMPLED: 15											
SAMPLE DESCRIPTION	DN/GOMME	:NIS: <u>5</u>	шу реа	at, brow	n, very moi	SI.					
SAMPLING METHOD:	: Hand sco	оор									
QA/QC SAMPLES CO	LLECTED:		quipme	ent Blan	ık (EB)	☐ QA/QC Ext	tra Volu	ımes			
						ID					
Ambient Condition Blank (AB) Replicate of Soil Sample ID											
WATER PARAMETERS											
TIME PH CONDUCTIVITY TEMPERATURE SPECIFIC GRAVITY TURBIDIT									URBIDITY		
MONITORING READINGS											
HANBY SCREENING											
TIME	PID READING (ppm) CG/LEL (%) (standard/ppm)										
BG=Background; I	BZ=Breath	ing Zone	; BH=	Borehol	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncor	itained)	
						REQUESTED					
						, riedolo i es		ANCHO	DRAGE	LAB	
				ROW LA				ANCHORAGE			
ANALYSES	1		CON	TAINER	S	ANALYSES	/	CON	TAINE	HS	
		W	VATER		SOIL			WATER		SOIL	
TPH	1	1 liter			8 oz	VOC (8260)	1	3 x 40 ml	İ	4 oz	
РСВ	1					SVOC (8270)	1	1 liter		8 oz	
PESTICIDES	1					TOTAL METALS	1	1 liter		8 oz	
HVOC 8010	1	1 x 40	ml		4 oz	DISS METALS		1 liter			
VOC-BTEX 8020	1					TDS		250 ml			
						TSS		250 ml			
						тос		500 ml	·	4 oz	
						TCLP		2 liters		2 x 8 oz	

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

DATE: <u>08/23/93</u>			SAMPLE I	D: <u>LAY-BK</u>	GD-S03				
RADAR STATION: P									
SITE/AOC: BKGD			FEET FRO	OM FIXED P	OINT:	M/	AGNETIC HEA	DING:	
FIXED POINT: 170°	to southeas	st corner of I	nangar, 15	4° to top o	f radome, 150° to s	outhwe	st corner of m	<u>ain bu</u>	uilding train.
SAMPLE MATRIX:	Soil (S)	☐ Sedir	nent (SD)		Surface Water (SW)		Groundwater	(GW)	
SAMPLERS: SS, RC	<u> </u>		······································						
TIME SAMPLED: 16		•			• •		*******		
SAMPLE DESCRIPTION	ON/COMMI	ENTS: Silty	peat, heav	y organic n	naterial, brown - dar	k brow	n, very moist.		
CAMPINO METUOD	M								
SAMPLING METHOD									1 1110
QA/QC SAMPLES CO				, ,					
	n Olanlı (Af	Dupli	cate of W	ater Sample	ID			· · · · · · · · · · · · · · · · · · ·	
☐ Ambient Conditio	n Blank (Al	з) 🗆 керіі	cate of Sc	oli Sample II)				 -
			WA	TER PARAM	METERS				
TIME	PH	co	NDUCTIV	/ITY	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY
						1			
						-			
				***		- 			
								ļ	
	, "		MON	IITORING R	EADINGS				
					HANBY SCREEN	JING			
TIME	PID READ	ING (ppm)	CG/LE	EL (%)	(standard/ppm)	11110			
								T I	
								+	
			<u> </u>		<u> </u>				
BG=Background;	BZ=Breath	ing Zone; Bl	H=Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncor	ntained)
		-	✓ CHECK	ANALYSES	REQUESTED				
		RΔ	RROW LA	\R			ANCHO	BAGE	ΙΔR
							ANOTIC	TIAGE	
ANALYSES	1	CC	ONTAINEF	NS .	ANALYSES	1	CON	TAINE	RS
		WATE	ER	SOIL			WATER		SOIL
TPH	1	1 liter		8 oz	VOC (8260)	1	3 x 40 ml		4 oz
РСВ	1				SVOC (8270)	1	1 liter		8 oz
PESTICIDES	1				TOTAL METALS	1	1 liter		8 oz
HVOC 8010	1	1 x 40 ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1				TDS		250 ml		
					TSS		250 ml		
					тос		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to $\mathrm{4^{\circ}C}$

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

Bullen=BUL; Oliktok=OLi; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

MAGNETIC HEADING: Point Lay WEATHER: Overcast, drizzle, 45°F
SAMPLE MATRIX: Soil (S) Sediment (SD) Surface Water (SW) Groundwater (GW) SAMPLERS: SS, RC TIME SAMPLED: 14:15 DEPTH OF SAMPLE (feet): SAMPLE DESCRIPTION/COMMENTS: Same location as LAY-BKGD-SW01. Gray-brown to brown silty clay, moderate organism, saturated. SAMPLING METHOD: Dedicated sample scoop QA/QC SAMPLES COLLECTED: Guipment Blank (EB) QA/QC Extra Volumes Trip Blank (TB) Duplicate of Water Sample ID WATER PARAMETERS TIME PH CONDUCTIVITY TEMPERATURE SPECIFIC GRAVITY TURBIDIT BG=0 MONITORING READINGS HANBY SCREENING
SAMPLE MATRIX: Soil (S) Sediment (SD) Surface Water (SW) Groundwater (GW) SAMPLERS: SS, RC TIME SAMPLED: 14:15 DEPTH OF SAMPLE (feet): SAMPLE DESCRIPTION/COMMENTS: Same location as LAY-BKGD-SW01. Gray-brown to brown silty clay, moderate organism, saturated. SAMPLING METHOD: Dedicated sample scoop QA/QC SAMPLES COLLECTED: Equipment Blank (EB) QA/QC Extra Volumes Trip Blank (TB) Duplicate of Water Sample ID Ambient Condition Blank (AB) Replicate of Soil Sample ID WATER PARAMETERS TIME PH CONDUCTIVITY TEMPERATURE SPECIFIC GRAVITY TURBIDIT BG=0 MONITORING READINGS HANBY SCREENING
SAMPLERS: SS, RC TIME SAMPLED: 14:15
DEPTH OF SAMPLE (feet): SAMPLE DESCRIPTION/COMMENTS: Same location as LAY-BKGD-SW01. Gray-brown to brown sitty clay, moderate organicism, saturated. SAMPLING METHOD: Dedicated sample scoop QA/QC SAMPLES COLLECTED: Equipment Blank (EB) QA/QC Extra Volumes Trip Blank (TB) Duplicate of Water Sample ID MATER PARAMETERS TIME PH CONDUCTIVITY TEMPERATURE SPECIFIC GRAVITY TURBIDIT BG=0 MONITORING READINGS HANBY SCREENING
SAMPLE DESCRIPTION/COMMENTS: Same location as LAY-BKGD-SW01. Gray-brown to brown silty clay, moderate organizirm, saturated. SAMPLING METHOD: Dedicated sample scoop QA/QC SAMPLES COLLECTED: Equipment Blank (EB) QA/QC Extra Volumes Trip Blank (TB) Duplicate of Water Sample ID WATER PARAMETERS TIME PH CONDUCTIVITY TEMPERATURE SPECIFIC GRAVITY TURBIDIT BG=0 MONITORING READINGS HANBY SCREENING
irm, saturated. SAMPLING METHOD: Dedicated sample scoop QA/QC SAMPLES COLLECTED: Equipment Blank (EB) QA/QC Extra Volumes Trip Blank (TB) Duplicate of Water Sample ID Ambient Condition Blank (AB) Replicate of Soil Sample ID WATER PARAMETERS TIME PH CONDUCTIVITY TEMPERATURE SPECIFIC GRAVITY TURBIDIT BG=0 MONITORING READINGS HANBY SCREENING
SAMPLING METHOD: Dedicated sample scoop QA/QC SAMPLES COLLECTED: Equipment Blank (EB) QA/QC Extra Volumes Trip Blank (TB) Duplicate of Water Sample ID WATER PARAMETERS TIME PH CONDUCTIVITY TEMPERATURE SPECIFIC GRAVITY TURBIDIT BG=0 MONITORING READINGS HANBY SCREENING
Ambient Condition Blank (AB)
☐ Trip Blank (TB) ☐ Duplicate of Water Sample ID ☐ Ambient Condition Blank (AB) ☐ Replicate of Soil Sample ID ☐ WATER PARAMETERS TIME PH CONDUCTIVITY TEMPERATURE SPECIFIC GRAVITY TURBIDIT ☐ DESCRIPTION OF THE PARAMETERS BG=0 MONITORING READINGS HANBY SCREENING
Ambient Condition Blank (AB) Replicate of Soil Sample ID WATER PARAMETERS TIME PH CONDUCTIVITY TEMPERATURE SPECIFIC GRAVITY TURBIDIT BG=0 MONITORING READINGS HANBY SCREENING
WATER PARAMETERS TIME PH CONDUCTIVITY TEMPERATURE SPECIFIC GRAVITY TURBIDIT
TIME PH CONDUCTIVITY TEMPERATURE SPECIFIC GRAVITY TURBIDIT
BG=0 MONITORING READINGS HANBY SCREENING
HANBY SCREENING
HANBY SCREENING
HANBY SCREENING
HANBY SCREENING
HANBY SCREENING
BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)
✓ CHECK ANALYSES REQUESTED
BARROW LAB ANCHORAGE LAB
BARROW LAB
ANALYSES / CONTAINERS ANALYSES / CONTAINERS
WATER SOIL WATER SOIL
TPH ✓ 1 liter 8 oz
PCB SVOC (8270) / 1 liter 8 oz
PESTICIDES / TOTAL METALS / 1 liter 8 oz
HVOC 8010
VOC-BTEX 8020 ✓ TDS 250 ml
TSS 250 ml
TOC ✓ 500 ml 4 oz
TCLP 2 liters 2 x 8 d

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

DATE: <u>08/23/93</u>			SAMPLE I	D: <u>LAY-BK</u>	GD-SW01					
RADAR STATION: PO	oint Lay	\	VEATHER	: Overcast,	45°F	-i- A**				
SITE/AOC: BKGD		i	EET FRO	M FIXED P	OINT:	MA	GNETIC HEAL	DING:		
FIXED POINT: 222°									ding train	
SAMPLE MATRIX:	Soil (S)	☐ Sedim	ent (SD)	■ S	Surface Water (SW)		Groundwater (GW)		
SAMPLERS: <u>SS, RC</u>	C, JP									
TIME SAMPLED: 13										
SAMPLE DESCRIPTION	ON/COMME	:NIS: <u>Same</u>	location a	as LAY-BKG	3D-SD01.					
SAMPLING METHOD):									
QA/QC SAMPLES CO	-	☐ Equip	ment Blan	ık (EB)	QA/QC Ext	ra Volu	mes			
					ID					
☐ Ambient Conditio	n Blank (AB) 🗆 Replic	cate of So	il Sample IC						
			WA ⁻	TER PARAN	METERS					
TIME	PH	cc	NDUCTIV	IΤΥ	TEMPERATURE	SPE	CIFIC GRAVIT	ΥT	JRBIDITY	
13:03	6.4	150	DμS		8°C	1				
						<u> </u>				
			MON	ITORING R	EADINGS			- 1		
			000	-1	HANBY SCREEN	IING				
TIME	PID READ	ING (ppm)	CG/LE	:L (%)	(standard/ppm)					
BG=Background;	BZ=Breath	ing Zone; Bl	H=Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample ((uncor	tained)	
			✓ CHECK	ANALYSES	S REQUESTED					
		BA	RROW LA	AB			ANCHO	RAGE	LAB	
ANALYSES		C	ONTAINEF	IS	ANALYSES	1	CON	TAINE	RS	
AWALIGES		WAT		SOIL			WATER		SOIL	
TPH	1	1 liter		8 oz	VOC (8260)	1	3 x 40 ml		4 oz	
РСВ	1			}	SVOC (8270)	1	1 liter		8 oz	
PESTICIDES	1				TOTAL METALS	1	1 liter		8 oz	
HVOC 8010	1	1 x 40 ml		4 oz	DISS METALS	1	1 liter			
VOC-BTEX 8020	1				TDS	1	250 ml			
					TSS	1	250 ml			
					TOC	1	500 ml	ı	4 oz	
					TCLP		2 liters	<u> </u>	2 x 8 oz	

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

Bullen=BUL; Oliktok=OLi; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

DATE: <u>08/23/93</u>			SAMPLE I	D: <u>LAY-BK</u>	GD-SW02				
RADAR STATION: Point Lay WEATHER: Overcast, 45°F SITE/AOC: BKGD FEET FROM FIXED POINT: MAGNETIC HEADING:									
SITE/AOC: BKGD			FEET FRO	OM FIXED P	OINT:	MA	AGNETIC HEA	DING:	
FIXED POINT: 225° 1	to southeas	st corner of	nangar, 31	° to top of	radome, 313° to so	utheast	corner of ma	<u>in buil</u>	ding train.
SAMPLE MATRIX:			ment (SD)		Surface Water (SW)		Groundwater	(GW)	
SAMPLERS: RC, JP	· -			.	// · ·				
TIME SAMPLED: 11									
SAMPLE DESCRIPTION	ON/COMME	:NIS:					<u> </u>		
SAMPLING METHOD	: Dedicate	d sample so	оор						
QA/QC SAMPLES CO	DLLECTED:	☐ Equi	oment Bla	nk (EB)	☐ QA/QC Ex	tra Volu	umes		
☐ Trip Blank (TB)					ID				
☐ Ambient Condition	n Blank (AE	3) 🗌 Repl	cate of Sc	oil Sample II)				
			WA	TER PARAM	METERS				
TIME	PH	C	ONDUCTIV	/ITY	TEMPERATURE	SPE	CIFIC GRAVIT	Υ Τ	URBIDITY
11:01	8.2	17	0 μS		7°C				
BG=0			MON	IITORING R	EADINGS				
					HANBY SCREEN	JING			
TIME	PID READ	ING (ppm)	CG/LI	EL (%)	(standard/ppm)				
BG=Background;	BZ=Breath	ing Zone; B	H=Boreho	ole; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncor	ntained)
,					S REQUESTED				
		B	ARROW LA		TIEGOEOTES		ANCHO	RAGE	LAB
			ONTAINER		ANALYSES	1		TAINE	
ANALYSES	1			1	ANALTSES	•			
		WAT	ER	SOIL			WATER		SOIL
TPH	1	1 liter		8 oz	VOC (8260)	1	3 x 40 ml		4 oz
PCB	/				SVOC (8270)	1	1 liter		8 oz
PESTICIDES	/		<u> </u>		TOTAL METALS	1	1 liter		8 oz
HVOC 8010	<u> </u>	1 x 40 ml		4 oz	DISS METALS	/	1 liter		
VOC-BTEX 8020	1				TDS	/_	250 ml		
					TSS	/	250 ml		
ТС					тос	1	500 ml	l	4 oz
					TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet) (i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

SAMPLE COLLECTION LOGS FOR QA/QC

DATE: <u>08/24/93</u>		S/	AMPLE II	D: <u>LAY-AB</u> (01				
RADAR STATION: P									
SITE/AOC:		FEET	FROM !	FIXED POIN	IT:	MAGN	IETIC HEADIN	IG:	
FIXED POINT:									
SAMPLE MATRIX:	• •		ent (SD)		Surface Water (SW)		Groundwater	(GW)	
SAMPLERS: <u>RC, JC</u> TIME SAMPLED: <u>13</u>). - -	D	EPTH O	SAMPLE	(foot):				
SAMPLE DESCRIPTION									
SAMPLING METHOD									
QA/QC SAMPLES CO									
☐ Trip Blank (TB)■ Ambient Conditio	n Plank (AE				ID				
Ambient Conditio	II DIAIIK (AL	o) 🗆 Neplica							
				TER PARAN		T			
TIME	PH	CON	DUCTIV	'ITY	TEMPERATURE	SPE	CIFIC GRAVIT	Y T	URBIDITY
		•	MON	ITORING R	EADINGS				
		****			HANBY SCREEN	NING			
TIME	PID READ	ING (ppm)	CG/LE	EL (%)	(standard/ppm)				
BG=Background;	BZ=Breath	ina Zone: BH:	=Boreho	le: NR=No	Readings: HS=Hea	adspace	e; S=Sample	(uncor	ntained)
					S REQUESTED	•			
					REGUESTED		ANGUI	DAGE	LAD
		BAH	ARROW LAB				ANCHORAGE		: LAB
ANALYSES	1	CO	NTAINER	IS	ANALYSES	1	CON	ITAINE	RS
		WATER	₹	SOIL			WATER		SOIL
TPH		1 liter		8 oz	VOC (8260)	1	3 x 40 mi		4 oz
PCB		1			SVOC (8270)		1 liter		8 oz
PESTICIDES					TOTAL METALS		1 liter		8 oz
HVOC 8010		1 x 40 ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020					TDS		250 ml		
					TSS		250 ml		
					тос		500 ml		4 oz
					TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; Ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

DATE:			_ SA	MPLE I	D: <u>LAY-AB</u> (02					
RADAR STATION: PO	oint Lay		WE	ATHER	•						
SITE/AOC:					FIXED PO	NT:	_ MAG	INETIC HEAD	ING: _		
IXED POINT:											
SAMPLE MATRIX:											
SAMPLERS:				DTU OF	0414015	//\\.					
TIME SAMPLED:	221/002445	NTO.	_ DE	PIH OF	SAMPLE	(teet):					
SAMPLE DESCRIPTION	JN/COMME	:N15:									
SAMPLING METHOD	:										
QA/QC SAMPLES CO							ra Volu	ımes			
						ID					
Ambient Condition	n Blank (AE) 🗆 R	eplicat	e of Soi	i Sample II)					
					TER PARAM						
	Bu		CON			TEMPERATURE	SPE	CIFIC GRAVITY T		URBIDITY	
TIME	PH		CON	DUCTIV		TEWFERATORE	31 2	On to divivit	` `	011010111	
							ļ				
	_1			MON	ITORING R	FADINGS					
			1	WON	TO THE T		"NC				
TIME	PID READ	ING (pp	m)	CG/LE	L (%)	HANBY SCREEN (standard/ppm)	iing		ļ		
			,								
BG=Background;	BZ=Breath	ing Zone	e; BH=	Borehol	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncor	tained)	
			1	CHECK	ANALYSE	S REQUESTED					
			BAR	ROW LA	В			ANCHO	HORAGE LAB		
								CONTAINERS		RS.	
ANALYSES	_ /		CON	TAINER		ANALYSES	/				
		V	VATER		SOIL			WATER		SOIL	
TPH		1 liter			8 oz	VOC (8260)	1	3 x 40 ml		4 oz	
РСВ						SVOC (8270)		1 liter		8 oz	
PESTICIDES						TOTAL METALS		1 liter	L	8 oz	
HVOC 8010		1 x 40	ml		4 oz	DISS METALS		1 liter			
VOC-BTEX 8020						TDS		250 ml			
				.1		TSS		250 ml			
						TOC		500 ml		4 oz	
						TCLP		2 liters		2 x 8 oz	
									1		
					<u> </u>	<u> </u>		1		<u> </u>	

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

DATE: <u>08/23/93</u>			SA	AMPLE I	D: <u>LAY-EB</u>	01				
RADAR STATION: P	oint Lay		W	EATHER	R:					
SITE/AOC: Equipme	nt Blank		FE	EET FRO	OM FIXED F	POINT:	M/	AGNETIC HEA	DING:	
FIXED POINT:									·	
SAMPLE MATRIX: [SAMPLERS: <u>ASP</u>				nt (SD)		Surface Water (SW)		Groundwater	(GW)	
TIME SAMPLED: 13				PTH O	E SAMPLE	(foot):				
SAMPLE DESCRIPTION										
SAMPLING METHOD):									
QA/QC SAMPLES CO		•					tra Voli	ımes		
☐ Trip Blank (TB)						ID				
☐ Ambient Conditio	n Blank (Al	3) 🗆 F	Replica	te of So	il Sample II)				
				WA ⁻	TER PARA	METERS				
TIME	PH		CON	DUCTIV	IVITY TEMPERATURE			CIFIC GRAVIT	ΥΙ	URBIDITY
				MON	ITORING R	EADINGS				
	3.03					HANBY SCREEN	NING			
TIME	PID READ	ING (pp	om)	CG/LE	L (%)	(standard/ppm)				
BG=Background;	BZ=Breath	ing Zone	e; BH=	Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncor	ntained)
			1	CHECK	ANALYSES	REQUESTED				
			BAR	ROW LA	λB		ANCHO		DRAGE LAB	
ANALYSES	1		CON	ITAINER	S	ANALYSES	1	CON	TAINE	RS
		>	VATER	l	SOIL			WATER		SOIL
TPH	1	1 liter		1 '44'85'	8 oz	VOC (8260)	1	3 x 40 ml		4 oz
РСВ	1					SVOC (8270)	1	1 liter		8 oz
PESTICIDES	1					TOTAL METALS	1	1 liter		8 oz
HVOC 8010	1	1 x 40	ml		4 oz	DISS METALS		1 liter		
VOC-BTEX 8020	1					TDS		250 ml		
						TSS		250 ml		
						тос		500 ml		4 oz
				· · · · · · · · · · · · · · · · · · ·		TCLP		2 liters		2 x 8 oz

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; Ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

DATE: <u>08/24/93</u>			SAM	PLE IC): <u>LAY-EBC</u>)2					
RADAR STATION: P	oint Lay		WEA	THER	·						
SITE/AOC:						OINT:	MA	GNETIC HEA	DING:		
FIXED POINT:											
SAMPLE MATRIX: C			ediment	(SD)	□s	Surface Water (SW)		Groundwater	(GW)		
TIME SAMPLED: 13	3:50		DEP	TH OF	SAMPLE ((feet):					
SAMPLE DESCRIPTION											
SAMPLING METHOD									D.I. fo	r others.	
QA/QC SAMPLES CO											
	- Dii- (AF	U D∪	uplicate	of Wa	ter Sample	ID					
☐ Ambient Conditio	n Blank (At	s) 🗆 Re	eplicate	or Soi	Sample IL	<u> </u>					
		1		WAT	ER PARAM	METERS	1				
TIME	PH		CONDU	JCTIVI	TY	TEMPERATURE	SPE	CIFIC GRAVIT	YT	URBIDITY	
							į				
				MONI	TORING RI	EADINGS			'		
						HANBY SCREEN	IING				
TIME	PID READ	ING (ppr	n) (CG/LE	L (%)	(standard/ppm)					
						•					
BG=Background;	BZ=Breath	ing Zone;	; BH=B	orehol	e; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncor	ntained)	
			√ Cl	HECK	ANALYSES	REQUESTED					
			BARRO	DW LAB				ANCHORAGE		E LAB	
ANALYSES	1		CONTA	AINER	S	ANALYSES	1	CON	TAINE	RS	
		W	ATER		SOIL			WATER		SOIL	
TPH	1	1 liter			8 oz	VOC (8260)	1	3 x 40 ml		4 oz	
РСВ	1					SVOC (8270)	1	1 liter		8 oz	
PESTICIDES						TOTAL METALS	1	1 liter		8 oz	
HVOC 8010	1	1 x 40	m1		4 oz	DISS METALS	1	1 liter			
VOC-BTEX 8020	1					TDS		250 ml			
						TSS		250 ml			
						тос		500 ml		4 oz	
						TCLP		2 liters		2 x 8 oz	

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

DATE: <u>09/07/93</u>			SAMPLI	E ID: <u>LAY-EB</u>	03					
RADAR STATION: <u>P</u>	oint Lay		WEATH	ER:						
SITE/AOC:					OINT:	MA	AGNETIC HEA	DING:		
FIXED POINT:										
SAMPLE MATRIX: [SAMPLERS:					Surface Water (SW)		Groundwater	(GW)		
TIME SAMPLED:			DEPTH	OF SAMPLE	(feet):					
SAMPLE DESCRIPTI										
SAMPLING METHOD);									
QA/QC SAMPLES C					☐ QA/QC Ex	tra Volu	umes			
				plicate of Water Sample ID						
Ambient Condition	n Blank (Al	3) 🗆 Re	plicate of	Soil Sample II	o					
				VATER PARAI						
TIME	PH		CONDUC	TIVITY	TEMPERATURE	SPE	CIFIC GRAVIT	ΥT	URBIDITY	
			1.00							
			M	ONITORING R	EADINGS					
					HANBY SCREEN	NING				
TIME	PID READ	ING (ppn	n) CG	/LEL (%)	(standard/ppm)					
BG=Background;	BZ=Breath	ing Zone;	BH=Bore	hole; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncor	ntained)	
			✓ CHE	CK ANALYSES	S REQUESTED					
			BARROW	LAB			ANCHO	RAGE	LAB	
ANALYSES			CONTAIN	ERS	ANALYSES	1	CON	TAINE	RS	
		W	ATER	SOIL			WATER		SOIL	
TPH		1 liter		8 oz	VOC (8260)	1	3 x 40 ml		4 oz	
РСВ					SVOC (8270)		1 liter		8 oz	
PESTICIDES					TOTAL METALS		1 liter		8 oz	
HVOC 8010		1 x 40 r	ml	4 oz	DISS METALS		1 liter			
VOC-BTEX 8020	1				TDS		250 ml			
VPH	1				TSS		250 ml			
EPH	1				тос		500 ml		4 oz	
					TCLP		2 liters		2 x 8 oz	
						1				

Preservation:

HVOC and VOC: HCl to pH <2; metals: $\mathrm{HNO_3}$ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

RADAR STATION: Point Lay WEATHER: SITE/AOC:
SAMPLE MATRIX: Soil (S) Sediment (SD) Surface Water (SW) Groundwater (GW) SAMPLERS: ICF KE TIME SAMPLED: 10:00 DEPTH OF SAMPLE (feet): SAMPLE DESCRIPTION/COMMENTS: Trip blank SAMPLING METHOD: Blanks made by Friedman and Bruya in Barrow. DA/QC SAMPLES COLLECTED: Equipment Blank (EB) QA/QC Extra Volumes Trip Blank (TB) Duplicate of Water Sample ID Ambient Condition Blank (AB) Replicate of Soil Sample ID WATER PARAMETERS
SAMPLE MATRIX: Soil (S) Sediment (SD) Surface Water (SW) Groundwater (GW) SAMPLERS: ICF KE TIME SAMPLED: 10:00 DEPTH OF SAMPLE (feet): SAMPLE DESCRIPTION/COMMENTS: Trip blank SAMPLING METHOD: Blanks made by Friedman and Bruya in Barrow. QA/QC SAMPLES COLLECTED: Equipment Blank (EB) QA/QC Extra Volumes Trip Blank (TB) Duplicate of Water Sample ID Ambient Condition Blank (AB) Replicate of Soil Sample ID WATER PARAMETERS
SAMPLERS: ICF KE TIME SAMPLED: 10:00 DEPTH OF SAMPLE (feet): SAMPLE DESCRIPTION/COMMENTS: Trip blank SAMPLING METHOD: Blanks made by Friedman and Bruya in Barrow. DA/QC SAMPLES COLLECTED: Equipment Blank (EB) QA/QC Extra Volumes Trip Blank (TB) Duplicate of Water Sample ID Ambient Condition Blank (AB) Replicate of Soil Sample ID WATER PARAMETERS
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Ambient Condition Blank (AB)
WATER PARAMETERS
THE PARTY OF CONTROL OF ANITY THEREIN
TIME PH CONDUCTIVITY TEMPERATURE STEERING GLAVITY TOTALS.
MONITORING READINGS
HANBY SCREENING
TIME PID READING (ppm) CG/LEL (%) (standard/ppm)
BG=Background; BZ=Breathing Zone; BH=Borehole; NR=No Readings; HS=Headspace; S=Sample (uncontained)
✓ CHECK ANALYSES REQUESTED
BARROW LAB ANCHORAGE LAB
ANALYSES CONTAINERS ANALYSES CONTAINERS
WATER SOIL WATER SOIL
TPH 1 liter 8 oz VOC (8260) 3 x 40 ml 4 oz
PCB SVOC (8270) 1 liter 8 oz
PESTICIDES TOTAL METALS 1 liter 8 oz
HVOC 8010
VOC-BTEX 8020 ✓ TDS 250 ml
TSS 250 ml
TOC 500 ml 4 oz
TCLP 2 liters 2 x 8 c

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; lce all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

					02					
RADAR STATION: <u>P</u>	oint Lay		WEATHER	R:						
SITE/AOC: <u>Trip Blan</u>	<u>k</u>		FEET FRO	M FIXED P	DINT:	_ MA	GNETIC HEAD	DING:		
FIXED POINT:										
SAMPLE MATRIX:			ment (SD)		Surface Water (SW)	Ц	Groundwater	(GW)		
SAMPLERS: <u>ICF KE</u> TIME SAMPLED: <u>08</u>			DERTH OF	CAMPLE	/fact\:	<u> </u>				
SAMPLE DESCRIPTION										
SAMPLING METHOD):									
QA/QC SAMPLES C	OLLECTED:	-	-							
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Ambient Condition	n Blank (Al	3) 🗌 Repl	icate of So	il Sample II)					
			WA	TER PARAM	METERS					
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BG=Background;	BZ=Breath	ing Zone; B	H=Boreho	le; NR=No	Readings; HS=Hea	dspace	e; S=Sample	(uncor	ntained)	
			4 CHECK	ANALVEE	S REQUESTED		1.00			
	ı				3 REGUESTED		41000			
		В.	ARROW LA	<u></u>			ANCHO	HAGE	LAB	
ANALYSES	1	С	ONTAINEF	IS .	ANALYSES	1	CON	TAINE	RS	
		WAT	ER	SOIL			WATER		SOIL	
TPH		1 liter		8 oz	VOC (8260)	1	3 x 40 ml		4 oz	
РСВ					SVOC (8270)		1 liter		8 oz	
PESTICIDES					TOTAL METALS		1 liter		8 oz	
HVOC 8010	1	1 x 40 ml		4 oz	DISS METALS		1 liter			
VOC-BTEX 8020	1				TDS		250 ml			
					TSS	<u> </u>	250 ml			
					тос		500 ml		4 oz	
II .	I			 	 		 		 	
					TCLP		2 liters		2 x 8 oz	

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; Ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes:

Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

ADAR STATION: Point Lay	DATE: <u>08/25/93</u>			SAMPLE	ID: <u>LAY-TB</u>	03				
MAPLE MATERS Soil (S)	RADAR STATION: <u>P</u>	oint Lay		WEATHE	? :					
AMPLE MATRIX: Soli (S) Sediment (SD) Surface Water (SW) Groundwater (GW) AMPLERS: DEPTH OF SAMPLE (feet):						OINT:	_ MA	GNETIC HEAL	DING:	
AMPLERS: ME SAMPLED	FIXED POINT:									
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AMPLING METHOD: AMPLING METHOD: AMPLING MET	TIME SAMPLED			DEPTH O	F SAMPLE	(feet):				
AMPLING METHOD: ACQC SAMPLES COLLECTED:	SAMPLE DESCRIPTI	ON/COMMI	ENTS:							
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Trip Blank (TB)										
Ambient Condition Blank (AB)	QA/QC SAMPLES C	OLLECTED:	: 🗆 Ed	quipment Bla	nk (EB)	☐ QA/QC Ex	tra Volu	umes		
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TIME	Ambient Condition	n Blank (Al	3) 🗌 Re	plicate of So	oil Sample II)				
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BARROW LAB BARROW LAB BARROW LAB BARROW LAB CONTAINERS REQUESTED	TIME	PID READ	ING (ppn	n) CG/L	EL (%)					
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BARROW LAB BARROW LAB BARROW LAB BARROW LAB CONTAINERS REQUESTED										
BARROW LAB BARROW LAB BARROW LAB BARROW LAB CONTAINERS REQUESTED	BG=Background;	BZ=Breath	ing Zone;	BH=Boreho	ole; NR=No	Readings; HS=Hea	dspac	e; S=Sample	(uncor	ntained)
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TPH 1 liter 8 oz VOC (8260) ✓ 3 x 40 ml 4 oz PCB SVOC (8270) 1 liter 8 oz PESTICIDES TOTAL METALS 1 liter 8 oz HVOC 8010 1 x 40 ml 4 oz DISS METALS 1 liter VOC-BTEX 8020 TDS 250 ml TSS 250 ml TOC 500 ml 4 oz	ANALYSES	- 1		CONTAINE	નડ 1	ANALYSES	/			
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PESTICIDES TOTAL METALS 1 liter 8 oz HVOC 8010 1 x 40 ml 4 oz DISS METALS 1 liter VOC-BTEX 8020 TDS 250 ml TSS 250 ml TOC 500 ml 4 oz	ТРН		1 liter		8 oz	VOC (8260)	1	3 x 40 ml		4 oz
HVOC 8010	РСВ					SVOC (8270)		1 liter		8 oz
VOC-BTEX 8020 TDS 250 ml TSS 250 ml TOC 500 ml 4 oz	PESTICIDES					TOTAL METALS		1 liter		8 oz
TSS 250 ml TOC 500 ml 4 oz	HVOC 8010		1 x 40 r	ml	4 oz	DISS METALS		1 liter		
TOC 500 ml 4 oz	VOC-BTEX 8020					TDS		250 ml		
						TSS		250 ml		
TCLP 2 liters 2 x 8 oz						тос		500 ml	r	4 oz
						TCLP		2 liters		2 x 8 oz
									·	

Preservation:

HVOC and VOC: HCl to pH <2; metals: HNO₃ to pH <2; Ice all samples to 4°C

Sample ID Format:

Radar Station - site identifier - matrix + sample number - depth (feet)

(i.e., BUL-ST05-SW07, BTR-EB04, WRT-SS08-S09-5.0)

Radar Station Codes: Bullen=BUL; Oliktok=OLI; Barter=BTR; Lonely=LON; Barrow=BRW; Wainwright=WRT; Lay=LAY; Lisburne=LIS

APPENDIX E CHAIN-OF-CUSTODY FORMS

ICF KASER ENGINEERS CHAIN

CHAIN OF CUSTODY RECORD

NO 1535

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ON ON		TANKENS	20	4							Reinquished by Sphadina	TONKIII VALLA	Reinquesed by (Sgnasure)	Date / Time Remarks:
DEW LINE WIFE	3	STATION LOCATION TAIN		LAY-BKND-540024							Date / Time Received by Sprature)		/ Date / Time Rebaired by: (Sign aura)	Date / Time Received for Laboratory by: (Signature)
<u>a</u>	AXX More	STAT. NO. DATE TIME COMP.	Point Lay 8-23 1315 X	Painter 9-33 1115 V							Definition of Computation	Same	Reinquished by: (Sifnative)	Refriquished by: (Signature)

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CHAIN OF CUST	1.178 KI/FS	STATION LOCATION TAINERS	-TBal 6	LAY- 12KAID-5W02- 52			Date / Time Received by Symatrice R	Date / Time Received for Laboratory by: (Signature)
KAISER	NAME	STAT. NO. DATE TIME GRAB		7 1115			Reinquisted by: (Signature)	Refriquished by (Signature)

ICF KANSER ENGINEERS

CHAIN OF CUSTODY RECORD



Reinquished by: (Sgrature) Reinquished by: (Sgrature) Date / Time Remarks: Signature)
Date / Time Received for Laboratory by: Date / Time Remarks:

NO. 0538

CHAIN OF CUSTODY RECORD

a selle kigh concertiation Deese ble luck concourted **REMARKS** Received by: (Signature) i.me Date / Time CONġ 6 7 Received for Laboratory by: (Signature) AY-BKIND-SOU AY - LOKUD - COM LA1-A0C5-505 -AY-AOCE-SUB 101-100 CV-101 AV-BK012-LN1-ACC5.54 STATION LOCATION - PYLD-14. AOCE. 41096412-01 DEW Line KI/FS おかられたいな Date / Time NIICF KAISER ENGINEERS KcΩ 83 155 0441 4.22 1355 1130 115 27: Relinquished by: (Signature) Relinquished by: (Signature) SAMPLERS: (Signature) Puntly STAT. NO.

CHAIN OF CUSTODY RECORD

s weart to he Y RMO REMARKS <u>8</u> 3 ğ 5 Received for Laboratory by: (Signature) ヘソ・13×100-543 M· アドラー SUL STATION LOCATION Alogh-up-colDC(), Line M/FS AY- PIGO-3.446.47 ICF KOSER ENGINEERS 1027 15/0 Point Lou 13.35 1330 SAMPLERS: (Spinature) Relinquished by: (Signature) STAT. NO.

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NO. 0540

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CHAIN OF CUSTODY RECORD



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CHAIN OF CUSTODY RECORD

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ICF KASER ENGINEERS C

CHAIN OF CUSTODY RECORD

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NO. 0546

CHAIN OF CUSTODY RECORD

REMARKS Received by: (Signature) <u>S</u> Date / Time CON-TAINERS ġ Ъ Fall SDEP Received for Laboratory by: (Signature) STATION LOCATION 406-412-01 DEW Line KI/15 **BA**AD ICF KAISER ENGINEERS PROJ. NO. 1430 158 120 日子 1520 <u>E</u>3 5% Qos) <u>رگ</u> 1550 S Z TIME Relinquished by: (Signature, SAMPLERS: (Signature) Infinduished by: (Signature Junt Lau STAT. NO.

ICF KOSER ENGINEERS CH

CHAIN OF CUSTODY RECORD

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NO. 0548

CHAIN OF CUSTODY RECORD

REMARKS Received by: (Signature) Received by: (Signature) Date / Time CON-TAINERS ġ STATION LOCATION 41 046412-01 DEW LINE KI/FS 8AAB ICF KAISER ENGINEERS Cety 14.8 STAT. NO.

ICF KOSER CHAIN OF CUSTODY RECORD

NO 1587

PROJ. NO.		PROJECT NAME	뿔			Г
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NO. 0585

ICF KAISER CHAIN OF CUSTODY RECORD

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PROJ. NO.		PROJECT NAME	WE				DWH A
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APPENDIX F

ANALYTICAL DATA

- 1. SUMMARY TABLES OF ANALYTICAL DATA (presented in Sections 3.0 and 4.0)
- 2. CROSS-REFERENCE TABLE FOR SAMPLE IDENTIFICATION
- 3. ANALYTICAL DATA (for each site CT&E Data is presented first followed by F&B Data)

1. SUMMARY TABLES OF ANALYTICAL DATA (presented in Sections 3.0 and 4.0)

2. CROSS-REFERENCE TABLE FOR SAMPLE IDENTIFICATION

CROSS-REFERENCE SAMPLE IDENTIFICATION

	SAMPLE DESCRIPTION		Sediment	Sediment	Sediment	Sediment	Sediment Duplicate	Sediment Spike	Sediment Spike Duplicate	Sediment	Sediment	Sediment	Sediment	Sediment Duplicate	Sediment Spike
ABORATORY BATCH IDENTIFICATION	F&B		#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93				#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93		
LABORAT	CT&E					93.4354	93.4354	93.4354	93.4354				93.4656	93.4356	93.4356
ORY	F&B		478	480	482	484				486	488	490	492		
LABORATORY IDENTIFICATION	CT&E	(LF01)				93.4354-6	93.4354-8	93.4354-7	93.4354-12				93.4356-13	93.4356-15	93.4356-14
SATCH	F&B	Deactivated Landfill (LF01)	546	546	546	546				546	546	546	546		
FIELD BATCH IDENTIFICATION	CT&E	Deactiv				541	541	541	541				540	540 ·	540
	SITE IDENTIFICATION		LF01	LF01	LF01	LF01	LF01	LF01	LF01	LF01	LF01	LF01	LF01	LF01	LF01
FIELD CHAIN-OF- CUSTODY AND DATA	VALIDATION SAMPLE IDENTIFICATION		LAY-LF01-SD01	LAY-LF01-SD02	LAY-LF01-SD03	LAY-LF01-SD04	LAY-LF01-SD04DP	LAY-LF01-SD04S	LAY-LF01-SD04SD	LAY-LF01-SD05	LAY-LF01-SD06	LAY-LF01-SD07	LAY-LF01-SD08	LAY-LF01-SD08DP	LAY-LF01-SD08S
RI/FS TEXT AND	TABLE SAMPLE IDENTIFICATION		LAY-LF01-SD01	LAY-LF01-SD02	LAY-LF01-SD03	LAY-LF01-SD04	LAY-LF01-SD04	LAY-LF01-SD04	LAY-LF01-SD04	LAY-LF01-SD05	LAY-LF01-SD06	LAY-LF01-SD07	LAY-LF01-SD08	LAY-LF01-SD08	LAY-LF01-SD08

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CROSS-REFERENCE SAMPLE IDENTIFICATION (CONTINUED)

	SAMPLE DESCRIPTION		Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment Spike	Sediment Spike Duplicate	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water Duplicate	Surface Water Spike
LABORATORY BATCH IDENTIFICATION	F&B		#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93						#5-08/27/93 #3&4-08/25/93	#5-08/27/93 #3&4-08/25/93	#5-08/27/93 #3&4-08/25/93	#5-08/27/93 #3&4-08/25/93		
LABORAT	CT&E					93.4692	93.4692	93.4692	93.4692	93.4692				93.4358 93.4356	93.4358	93.4358
ORY ATION	F&B		494	496	498						559 592	269 295	561 598	562 601		
LABORATORY IDENTIFICATION	CT&E	Deactivated Landfill (LF01) (Continued)				93.4692-11	93.4692-12	93,4692-15	93.4692-13	93.4692-14				93.4358-1 93.4656-10	93.4358-3	93.4358-2
SATCH	F&B	andfill (LF01	546	546	546						543 545	543 545	543 545	543 545		
FIELD BATCH IDENTIFICATION	CT&E	eactivated La				585	585	585	585	585				540 547	547	547
	SITE IDENTIFICATION	O	LF01	LF01	LF01	LF01	LF01	LF01	LF01	LF01	LF01	LF01	LF01	LF01	LF01	LF01
FIELD CHAIN-OF- CUSTODY AND DATA	VALIDATION SAMPLE IDENTIFICATION		LAY-LF01-SD09	LAY-LF01-SD10	LAY-LF01-SD11	LAY-LF01-2SD12	LAY-LF01-2SD13	LAY-LF01-2SD14	LAY-LF01-2SD13S	LAY-LF01-2SD13SD	LAY-LF01-SW01	LAY-LF01-SW02	LAY-LF01-SW03	LAY-LF01-SW04	LAY-LF01-SW04DP	LAY-LF01-SW04S
RI/FS TEXT AND	RI/FS TEXT AND TABLE SAMPLE IDENTIFICATION		LAY-LF01-SD09	LAY-LF01-SD10	LAY-LF01-SD11	LAY-LF01-2SD12	LAY-LF01-2SD13	LAY-LF01-2SD14	LAY-LF01-2SD13	LAY-LF01-2SD13	LAY-LF01-SW01	LAY-LF01-SW02	LAY-LF01-SW03	LAY-LF01-SW04	LAY-LF01-SW04	LAY-LF01-SW04

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CROSS-REFERENCE SAMPLE IDENTIFICATION (CONTINUED)

FIELD BATCH LABORATORY LABORATORY BATCH IDENTIFICATION IDENTIFICATION	SITE SAMPLE SAMPLE NTIFICATION CT&E F&B CT&E F&B DESCRIPTION	Deactivated Landfill (LF01) (Continued)	1 547 93.4358-6 93.4358 Surface Water Spike Duplicate	1 543 563 #5-08/27/93 Surface Water 545 604 #3&4-08/25/93	1 543 564 #5-08/27/93 Surface Water 545 609 #3&4-08/25/93	1 543 565 #5-08/27/93 Surface Water 545 612 #3&4-08/25/93	1 540 543 93.4356-11 566 93.4356 #5-08/27/93 Surface Water 547 545 613 #3&4-08/27/93	1 585 93.4692-9 93.4692 Surface Water	
	F&B			563 604	564 609	565 612	566 613		
LABOR	CT&E) (Continued)	93.4358-6				93.4356-11	93,4692-9	93.4692-10
FIELD BATCH IDENTIFICATION	F&B	Landfill (LF01		543 545	543 545	543 545	543 545		
	CT&E	Jeactivated I	547				540 547	585	585
SITE			LF01	LF01	LF01	LF01	LF01	LF01	LF01
FIELD CHAIN-OF- CUSTODY AND DATA VALIDATION SAMPLE IDENTIFICATION			LAY-LF01-SW04SD	LAY-LF01-SW05	LAY-LF01-SW06	LAY-LF01-SW07	LAY-LF01-SW08	LAY-LF01-2SW09	LAY-LF01-2SW10
RI/FS TEXT AND TABLE SAMPLE IDENTIFICATION			LAY-LF01-SW04	LAY-LF01-SW05	LAY-LF01-SW06	LAY-LF01-SW07	LAY-LF01-SW08	LAY-LF01-2SW09	LAY-LF01-2SW10

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	SAMPLE DESCRIPTION		Soll	Soil	Soil	Soil	Soil	Soil	Soil	Soil Spike	Soil Spike Duplicate	Soil	Soil	Soil
ABORATORY BATCH IDENTIFICATION	F&B		#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93
LABORATO	CT&E				93.4354							93.4354		
ORY TION	F&B		929	638	640	642	644	646	648	648	648	650	652	654
LABORATORY IDENTIFICATION	CT&E				93.4354-4							93.4354-5		
ATCH	F&B	Garage (SS06)	542	542	542	542	542	542	542	542	542	542	542	542
FIELD BATCH IDENTIFICATION	CT&E	Gē			541				,			541		
	SITE IDENTIFICATION		9088	9088	9088	9088	9088	9088	9088	9088	9088	9088	9088	9088
FIELD CHAIN-OF-	VALIDATION SAMPLE IDENTIFICATION		LAY-SS06-S01	LAY-SS06-S02	LAY-SS06-S03	LAY-SS06-S04	LAY-SS06-S05	LAY-SS06-S06	LAY-SS06-S07	LAY-SS06-S07S	LAY-SS06-S07SD	LAY-SS06-S08	LAY-SS06-S09	LAY-SS06-S10
CIAA TVOT SOLID	TABLE SAMPLE IDENTIFICATION		LAY-SS06-S01	LAY-SS06-S02	LAY-SS06-S03	LAY-SS06-S04	LAY-SS06-S05	LAY-SS06-S06	LAY-SS06-S07	LAY-SS06-S07	LAY-SS06-S07	LAY-SS06-S08	LAY-SS06-S09	LAY-SS06-S10

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	SAMPLE DESCRIPTION		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Sediment	Sediment Duplicate	Sediment Spike	Sediment Spike Duplicate	Sediment	Sediment	Sediment	Sediment
LABORATORY BATCH IDENTIFICATION	F&B		#5-08/25/93 #1&2-08/25/93							#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93	
LABORAT IDENT	CT&E			93.4693	93.4693	93.4693	93.4693	93.4693	93.4693								93 4693
ORY ATION	F&B		656							470	470	470	470	472	474	476	
LABORATORY IDENTIFICATION	CT&E	ntinued)		93.4693-14	93.4693-15	93.4693-16	93.4693-17	93.4693-18	93.4693-19								93 4693-11
SATCH CATION	F&B	(SS06) (Continued)	542							546	546	546	546	546	546	546	
FIELD BATCH IDENTIFICATION	CT&E	Garage		282	587	587	282	587	587								587
	SITE IDENTIFICATION		90SS	SS06	9088	9088	SS06	9088	9088	SS06	SS06	9088	SS06	SS06	9088	SS06	9088
FIELD CHAIN-OF- CUSTODY AND DATA	VALIDATION SAMPLE IDENTIFICATION		LAY-SS06-S11	LAY-SS06-2S12	LAY-SS06-2S13	LAY-SS06-2S14	LAY-SS06-2S15	LAY-SS06-2S16	LAY-SS06-2S18	LAY-SS06-SD01	LAY-SS06-SD01DP	LAY-SS06-SD01S	LAY-SS06-SD01SD	LAY-SS06-SD02	LAY-SS06-SD03	LAY-SS06-SD04	LAY-SS06-2SD05
RI/FS TEXT AND	TABLE SAMPLE IDENTIFICATION		LAY-SS06-S11	LAY-SS06-2S12	LAY-SS06-2S13	LAY-SS06-2S14	LAY-SS06-2S15	LAY-SS06-2S16	LAY-SS06-2S18	LAY-SS06-SD01	LAY-SS06-SD01	LAY-SS06-SD01	LAY-SS06-SD01	LAY-SS06-SD02	LAY-SS06-SD03	LAY-SS06-SD04	LAY-SS06-2SD05

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RI/FS TEXT AND	FIELD CHAIN-OF- CUSTODY AND DATA		FIELD I	FIELD BATCH IDENTIFICATION	LABORATORY IDENTIFICATION	ORY ATION	LABORAT	LABORATORY BATCH IDENTIFICATION	
TABLE SAMPLE IDENTIFICATION	VALIDATION SAMPLE IDENTIFICATION	SITE IDENTIFICATION	CT&E	F&B	CT&E	F&B	CT&E	F&B	SAMPLE DESCRIPTION
			Garage	Garage (SS06) (Continued)	tinued)				
LAY-SS06-2SD06	LAY-SS06-2SD06	9088	587		93.4693-12		93.4693		Sediment
LAY-SS06-2SD07	LAY-SS06-2SD07	9088			93.4693-13		93.4693		Sediment
LAY-SS06-SW01	LAY-SS06-SW01	9088		543		501 619		#5-08/27/93 #3&4-08/25/93	Surface Water
LAY-SS06-SW02	LAY-SS06-SW02	90SS	540 541 547	544	93.4354-10 93.4356-12 93.4358-5	567 622	93.4354 93.4356 93.4358	#5-08/27/93 #3&4-08/25/93	Surface Water
LAY-SS06-SW03	LAY-SS06-SW03	9088		544		500 626		#5-08/27/93 #3&4-08/25/93	Surface Water
LAY-SS06-SW04	LAY-SS06-SW04	90SS		244		499 616		#5-08/27/93 #3&4-08/25/93	Surface Water

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CT&E F&B

	SAMPLE DESCRIPTION		Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water Spike	Surface Water Spike	Surface Water	Surface Water
ABORATORY BATCH IDENTIFICATION	F&B		#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93	#5-08/25/93 #1&2-08/25/93				#5-08/27/93 #3&4-08/25/93	#5-08/27/93 #3&4-08/25/93	#5-08/27/93 #3&4-08/25/93					
LABORA1 IDENT	CT&E			93.4354			93.4354	93.4354	93.4354		93.4356		93.4692	93.4692	93.4692	93.4692	93.4692
ORY VTION	F&B		628	930	632	634				55 8 582	584 586	588 589					
LABORATORY IDENTIFICATION	CT&E	Drainage Pathways from POL Tanks (SS07		93.4354-9			93.4354-6	93.4354-7	93.4354-8		93.4356-7		93.4692-1	93.4692-2	93.4692-3	93.4692-4	93.4692-5
SATCH	F&B	ays from PO	542	542	542	542				543 545	543	543					
FIELD BATCH IDENTIFICATION	CT&E	nage Pathwa		541			585	585	585		540		585	585	585	585	585
	SITE IDENTIFICATION	Drai	SS07	SS07	SS07	SS07	2005	2088	SS07	2088	SS07	SS07	2005	SS07	SS07	2807	SS07
FIELD CHAIN-OF- CUSTODY AND DATA	VALIDATION SAMPLE IDENTIFICATION		LAY-SS07-SD01	LAY-SS07-SD02	LAY-SS07-SD03	LAY-SS07-SD04	LAY-SS07-2SD05	LAY-SS07-2SD06	LAY-SS07-2SD07	LAY-SS07-SW01	LAY-SS07-SW02	LAY-SS07-SW03	LAY-SS07-2SW04	LAY-SS07-2SW04S	LAY-SS07-2SW04SD	LAY-SS07-2SW05	LAY-SS07-2SW06
RI/FS TEXT AND	TABLE SAMPLE IDENTIFICATION		LAY-AOC4-SD01	LAY-AOC4-SD02	LAY-AOC4-SD03	LAY-AOC4-SD04	LAY-AOC4-2SD05	LAY-AOC4-2SD06	LAY-AOC4-2SD07	LAY-AOC4-SW01	LAY-AOC4-SW02	LAY-AOC4-SW03	LAY-AOC4-2SW04	LAY-AOC4-2SW04	LAY-AOC4-2SW04	LAY-AOC4-2SW05	LAY-AOC4-2SW06

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FIELD CHAIN-OF- CUSTODY AND DATA		FIELD BATCH IDENTIFICATION	SATCH	LABORATORY IDENTIFICATION	ORY	LABORAT	LABORATORY BATCH IDENTIFICATION	
DENT	SITE IDENTIFICATION	CT&E	F&B	CT&E	F&B	CT&E	F&B	SAMPLE DESCRIPTION
		Crushed	Crushed Drum Area (SS08)	(8088)				
SS08			538		417		#5-08/24/93 #1&2-08/24/93	Soil
8088			538		419		#5-08/24/93 #3&4-08/27/93	Soil
SS08			538		421		#5-08/24/93 #3&4-08/27/93	Soil
SS08			538		423		#5-08/24/93 #3&4-08/27/93	Soil
8208			538		425		#5-08/24/93 #3&4-08/27/93	Soil
8208		539	538	93.4327-2	427	93.4327	#5-08/24/93 #1&2-08/24/93	Soil
8088		539	538	93.4327-4	427	93.4327	#5-08/24/93 #1&2-08/24/93	Soil Duplicate
8088		539	538	93.4327-3	427	93.4327	#5-08/24/93 #1&2-08/24/93	Soil Spike
8208		539	538	93.4327-10	427	93.4327	#5-08/24/93 #1&2-08/24/93	Soll Spike Duplicate
8088			538		429		#5-08/24/93 #1&2-08/24/93	Soil
SS08		587		93.4693-1		93.4693		Soil
SS08		587		93.4693-2		93.4693		Soil Spike
SS08		587		93.4693-3		93.4693		Soil Spike Duplicate

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F-8

										-						
	SAMPLE DESCRIPTION		Soil	Soil	Soil Spike	Soil Spike Duplicate	Soil	Soil	Soil	Sediment	Sediment	Sediment	Surface Water	Surface Water Duplicate	Surface Water Spike	Surface Water Spike Duplicate
ABORATORY BATCH IDENTIFICATION	F&B									#5-08/25/93 #1&2-08/24/93	#5-08/25/93 #1&2-08/24/93	#5-08/25/93 #3&4-08/27/93	#5-08/27/93 #3&4-08/25/93			
LABORA' IDENT	CT&E		93.4693	93.4693	93.4693	93.4693	93.4693	93.4693	93.4693	93.4327			93.4356 93.4354	93.4354	93.4354	93.4354
ORY ATION	F&B									463	465	467	573 576			
LABORATORY IDENTIFICATION	CT&E	Crushed Drum Area (SS08) (Continued)	93.4693-4	93.4693-5	93.4693-6	93.4693-7	93.4693-8	93.4693-9	93.4693-10	93.4327-1			93.4356-6 93.4354-1	93.4354-3	93.4354-2	93.4354-11
FIELD BATCH DENTIFICATION	F&B	Area (SS0								537	537	537	543			
FIELD BATCH	CT&E	ushed Drum	287	587	587	587	287	587	587	539			540 541	541	541	541
	SITE IDENTIFICATION	Ö	8088	8088	8088	SS08	SS08	SS08	8208	SS08	SS08	SS08	SS08	SS08	SS08	8088
FIELD CHAIN-OF-	VALIDATION SAMPLE IDENTIFICATION		LAY-SS08-2S09	LAY-SS08-2S10	LAY-SS08-2S10S	LAY-SS08-2S10SD	LAY-SS08-2S11	LAY-SS08-2S12	LAY-SS08-2S15	LAY-SS08-SD01	LAY-SS08-SD02	LAY-SS08-SD03	LAY-SS08-SW01	LAY-SS08-SW01DP	LAY-SS08-SW01S	LAY-SS08-SW01SD
BI/FS TEXT AND	TABLE SAMPLE IDENTIFICATION		LAY-A0C5-2S09	LAY-AOC5-2S10	LAY-A0C5-2S10	LAY-AOC5-2S10	LAY-A0C5-2S11	LAY-A0C5-2S12	LAY-A0C5-2S15	LAY-AOC5-SD01	LAY-AOC5-SD02	LAY-AOC5-SD03	LAY-AOC5-SW01	LAY-AOC5-SW01	LAY-AOC5-SW01	LAY-AOC5-SW01

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OVEC TEXT AND	FIELD CHAIN-OF-		FIELD	FIELD BATCH DENTIFICATION	LABORATORY IDENTIFICATION	ORY	LABORAT	LABORATORY BATCH IDENTIFICATION	
TABLE SAMPLE IDENTIFICATION	VALIDATION SAMPLE IDENTIFICATION	SITE IDENTIFICATION	CT&E	F&B	CT&E	F&B	CT&E	F&B	SAMPLE DESCRIPTION
		Ō	rushed Drun	า Area (SS08)	Crushed Drum Area (SS08) (Continued)				
LAY-AOC5-SW02	LAY-SS08-SW02	8088		543		577 578		#5-08/27/93 #3&4-08/25/93	Surface Water

CT&E Commercial Testing and Engineering Co. F&B Friedman and Bruya, Inc.

	SAMPLE DESCRIPTION		Soil	Soil	Soil	Soil	Sediment	Surface Water	Surface Water Duplicate	Surface Water Spike	Surface Water Spike Duplicate	Surface Water
ABORATORY BATCH IDENTIFICATION	F&B		#5-08/24/93 #1&2-08/24/93	#5-08/24/93 #1&2-08/24/93	#5-08/24/93 #1&2-08/24/93	#5-08/24/93 #1&2-08/24/93	#5-08/24/93 #3&4-08/27/93	#5-08/25/93 #3&4-08/24/93				#5-08/25/93 #3&4-08/24/93
LABORAT IDENTI	CT&E		93.4327	93.4327	93.4327	93.4327	93.4327	93.4328 93.4329	93.4328	93.4329	93.4329	93.4328 93.4329
ORY	F&B		433	435	437	439	431	448 457				461 462
LABORATORY IDENTIFICATION	CT&E	GD)	93.4327-6	93.4327-7	93.4327-8	93.4327-9	93.4327-5	93.4328-5 93.4329-1	93.4328-7	93.4329-2	93.4329-3	93.4328-8 93.4329-4
SATCH	F&B	Background (BKGD)	538	538	538	538	538	537				537
FIELD BATCH IDENTIFICATION	CT&E	Back	539	539	539	539	539	535 536	536	535 536	535	535 536
	SITE IDENTIFICATION		вквр	вкер	вкар	вкер	вквр	вкср	вкар	вкер	вквр	вкар
FIELD CHAIN-OF- CUSTODY AND DATA	VALIDATION SAMPLE IDENTIFICATION		LAY-BKGD-S01	LAY-BKGD-S02	LAY-BKGD-S03	LAY-BKGD-S04	LAY-BKGD-SD01	LAY-BKGD-SW01	LAY-BKGD-SW01DP	LAY-BKGD-SW01S	LAY-BKGD-SW01SD	LAY-BKGD-SW02
RI/FS TEXT AND	TABLE SAMPLE IDENTIFICATION		LAY-BKGD-S01	LAY-BKGD-S02	LAY-BKGD-S03	LAY-BKGD-S04	LAY-BKGD-SD01	LAY-BKGD-SW01	LAY-BKGD-SW01	LAY-BKGD-SW01	LAY-BKGD-SW01	LAY-BKGD-SW02

CT&E Commercial Testing and Engineering Co. F&B Friedman and Bruya, Inc.

<u></u>	RI/FS TEXT AND	FIELD CHAIN-OF- CUSTODY AND DATA		FIELD	FIELD BATCH IDENTIFICATION	LABORATORY IDENTIFICATION	ORY	LABORAT	ABORATORY BATCH IDENTIFICATION	
	TABLE SAMPLE IDENTIFICATION	VALIDATION SAMPLE IDENTIFICATION	SITE IDENTIFICATION	CT&E	F&B	CT&E	F&B	CT&E	F&B	SAMPLE DESCRIPTION
لـــــا				Quality	Quality Assurance Samples	amples				
<u> </u>	LAY-AB01	LAY-AB01	QA/QC	540		93.4356-5		93.4356		Ambient Blank
	LAY-EB01	LAY-EB01	aA/ac	536	537	93.4328-2	443 446	93.4328	#5-08/25/93 #3&4-08/24/93	Equipment Blank
	LAY-EB01	LAY-EB01S	QA/QC	536		93.4328-3		93.4328		Equipment Blank Spike
	LAY-EB01	LAY-EB01SD	aA/ac	536		93.4328-4		93.4328		Equipment Blank Spike Duplicate
	LAY-EB02	LAY-EB02	aA/ac	540	543 545	93.4356-2	557 572	93.4356	#5-08/27/93 #3&4-08/25/93	Equipment Blank
F-12	LAY-EB02	LAY-EB02DP	aA/ac	540		93.4356-4		93.4356		Equipment Blank Duplicate
	LAY-EB02	LAY-EB02S	aA/ac	540		93.4356-3		93.4356		Equipment Blank Spike
	LAY-EB02	LAY-EB02SD	aA/ac	540		93.4356-16		93.4356		Equipment Blank Spike Duplicate
	LAY-EB03	LAY-EB03	QA/QC	585		93.4692-17		93.4692		Equipment Blank
	LAY-TB01	LAY-TB01	QA/QC	536	537	93.4328-1	441	93.4328	#3&4-08/24/93	Trip Blank
	LAY-TB02	LAY-TB02	QA/QC	540	543	93.4356-1	569	93.4356	#3&4-08/25/93	Trip Blank
	LAY-TB03	LAY-TB03	QA/QC	585		93.4692-16		93.4692		Trip Blank

Commercial Testing and Engineering Co. Friedman and Bruya, Inc.

CT&E F&B

3. ANALYTICAL DATA

ANALYTICAL DATA SHEETS FOR THE DEACTIVATED LANDFILL (LF01)



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.#

:93.4354-6

Client Sample ID :LAY-LF01-SD04 POINT LAY

:ICF KAISER ENGINEERING

Matrix

:SOIL

WORK Order

:70106

Report Completed :10/07/93 :08/24/93 @ 15:15 hrs

Project Name Project#

Client Name

Ordered By

:DEW LINE RI/FS

:RAY MORRIS

Collected Received

:08/26/93 @ 12:00 hrs

:41096-412-01

Technical Director: STEPHEN_C. EDE

5633 B STREET

TEL: (907) 562-2343 FAX: (907) 561-5301

ANCHORAGE, AK 99518

PWSID

:UA

Building //

Released By : Star

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C.

	·				alla	rlywi/Comma	ents		
			QC			Allowable	Ext.	Anal	
	Parameter	Results	Qual	Units	Method	Limits	Date	Date	Init
	Volatile Organics				EPA 8260				
	Benzene	0.050		mg/Kg	EPA 8260/J)	-A.1		09/13	KWM
	Bromobenzene	0.050	U	mg/Kg	EPA 8260 ,			09/13	KWM
	Bromochloromethane	0.050		mg/Kg	EPA 8260			09/13	KWM
	Bromodichloromethane	0.050		mg/Kg	EPA 8260			09/13	KWM
	Bromoform	0.050		mg/Kg	EPA 8260			09/13	KWM
	Bromomethane	0.050		mg/Kg	EPA 8260			09/13	KWM
	n-Butylbenzene .	0.050		mg/Kg	EPA 8260			09/13	KWM
	sec-Butylbenzene	0.050	ָט	mg/Kg	EPA 8260			09/13	KWM
,	tert-Butylbenzne	0.050	U	mg/Kg	EPA 8260			09/13	KWM
	Carbon Tetrachloride	0.050	; U	mg/Kg	EPA 8260			09/13	KWM
	Chlorobenzene	0.050	U	mg/Kg	EPA 8260			09/13	KWM
	Chloroethane	0.050		mg/Kg	EPA 8260			09/13	KWM
	Chloroform	0.050		mg/Kg	EPA 8260			09/13	KWM
	Chloromethane	0.050		mg/Kg	EPA 8260			09/13	KWM
	2-Chlorotoluene	0.050		mg/Kg	EPA 8260			09/13	KWM
	4-Chlorotoluene	0.050		mg/Kg	EPA 8260			09/13	KWM
	Dibromochloromethane	0.050		mg/Kg	EPA 8260			09/13	KWM
	12Dibromo3Chloropropane			mg/Kg	EPA 8260			09/13	KWM
	1,2-Dibromoethane	0.050		mg/Kg	EPA 8260			09/13	KWM
	Dibromomethane	0.050		mg/Kg	EPA 8260			09/13	KWM
	1,2-Dichlorobenzene	0.050		mg/Kg	EPA 8260			09/13	KWM
	1,3-Dichlorobenzene	0.050		mg/Kg	EPA 8260			09/13	KWM
	1,4-Dichlorobenzene	0.050		mg/Kg	EPA 8260			09/13	KWM
	Dichlorodifluoromethane	0.050		mg/Kg	EPA 8260			09/13	KWM
	1,1-Dichloroethane	0.050		mg/Kg	EPA 8260			09/13	KWM
	1,2-Dichloroethane	0.050		mg/Kg	EPA 8260			09/13	KWM
	1,1-Dichloroethene	0.050		mg/Kg	EPA 8260			09/13	KWM
	cis-1,2-Dichloroethene	0.050		mg/Kg	EPA 8260			09/13	KWM
	trans1,2-Dichloroethene	0.050		mg/Kg	EPA 8260			09/13	KWM
	1,2-Dichloropropane	0.050		mg/Kg	EPA 8260			09/13	KWM
	1,3-Dichloropropane	0.050		mg/Kg	EPA 8260			09/13	KWM
	2,2-Dichloropropane	0.050		mg/Kg	EPA 8260			09/13	KWM
	1,1-Dichloropropene	0.050		mg/Kg	EPA 8260			09/13	KWM
	Ethylbenzene	0.050		mg/Kg	EPA 8260			09/13	KWM
	Hexachlorobutadiene	0.050		mg/Kg	EPA 8260			09/13	KWM
	Isopropylbenzene	0.050		mg/Kg	EPA 8260			09/13	KWM
,	p-Isopropyltoluene	0.050	U	mg/Kg	EPA 8260√		08/26	09/13	KWM

00 2.2-94



SGS Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS 5633 B STREET Qualifui/Comments
EPA 8260(J)-4.1 Chemlab Ref.# :93.4354-6 ANCHORAGE, AK 99518 Client Sample ID :LAY-LF01-SD04 POINT LAY TEL: (907) 562-2343 FAX: (907) 561-5301 :SOIL Matrix 08/26 09/13 KWY. 0.050 Methylene Chloride ma/Ka EPA 8260 08/26 09/13 KWY. 0.050 Napthalene U mq/Ka 0.050 **EPA** 8260 08/26 09/13 KWM n-Propylbenzene U mg/Kg 0.050 EPA 8260 08/26 09/13 KWM U mg/Kg Styrene EPA 8260 08/26 09/13 KWE 0.050 U 1112-Tetrachloroethane mg/Kg EPA 8260 08/26 09/13 KWM 0.050 U 1122-Tetrachloroethane mq/Kq EPA 8260 08/26 09/13 KWM Tetrachloroethene 0.306 ma/Ka 0.050 U **EPA** 8260 08/26 09/13 KWM Toluene mg/Kg 1,2,3-Trichlorobenzene 0.050 U mg/Kg EPA 8260 08/26 09/13 KWM EPA 8260 08/26 09/13 1,2,4-Trichlorobenzene 0.050 Ü mg/Kg KWM EPA 8260 08/26 09/13 KWM 1,1,1-Trichloroethane 0.050 U mq/Kq 0.050 U **EPA** 8260 08/26 09/13 KWM 1,1,2-Trichloroethane mg/Kg U EPA 8260 08/26 09/13 KWM Trichloroethene 0.050 mq/Kq Trichlorofluoromethane 0.050 EPA 8260 08/26 09/13 KWM mq/Kq EPA 8260 08/26 09/13 1,2,3-Trichloropropane 0.050 mg/Kg KWM 1,2,4-Trimethylbenzene 0.055 mg/Kg EPA 8260 08/26 09/13 .KWM 0.050 EPA 8260 08/26 09/13 KWM 1,3,5-Trimethylbenzene H mg/Kg 08/26 09/13 0.050 U EPA 8260 KWM Vinyl Chloride mg/Kg 08/26 09/13 0.050 U EPA 8260 KWM p+m-Xylene mg/Kg EPA 8260 ₺ 08/26 09/13 o-Xylene 0.050 mg/Kg KWM Semivolatile Organics **EPA 8270** 0.400 **EPA 8270** 09/06 09/30 Phenol U mg/Kg TT HTT .bis(2-Chloroethyl)ether 0.400 : U EPA 8270 09/06 09/30 mg/Kg 0.400 **EPA** 8270 09/06 09/30 MTT 2-Chlorophenol 11 mg/Kg 0.400 1,3-Dichlorobenzene U EPA 8270 09/06 09/30 MTT mg/Kg 1,4-Dichlorobenzene 0.400 MTT **EPA** 8270 09/06 09/30 mg/Kg 1.38 09/06 09/30 Benzyl Alcohol mg/Kg EPA 8270 MTT 1.2-Dichlorobenzene 0.400 U mg/Kg EPA 8270 09/06 09/30 MTT 0.400 **EPA** 8270 09/06 09/30 2-Methylphenol mg/Kg MTT bis(2-Chloroisopropyl)e 0.400 mg/Kg **EPA 8270** 09/06 09/30 MTT 0.400 mg/Kg 09/06 09/30 4-Methylphenol EPA 8270 MTT n-Nitroso-di-n-Propylam 09/06 09/30 0.400 **EPA** 8270 mg/Kg MTT 0.400 U EPA 8270 09/06 09/30 MTT Hexachloroethane mg/Kg 0.400 **EPA** 8270 09/06 09/30 MTT Ħ Nitrobenzene mg/Kg 0.400 U **EPA** 8270 09/06 09/30 MTT Isophorone mg/Kg 09/06 09/30 2-Nitrophenol 0.400 U mg/Kg EPA 8270 MTT 2,4-Dimethylphenol 0.400 U **EPA** 8270 09/06 09/30 MTT mq/Kq **EPA** 8270 09/06 09/30 Benzoic Acid 0.400 U mg/Kg MTT 0.400 U **EPA 8270** 09/06 09/30 MTT bis(2-Chloroethoxy)Meth mg/Kg 2,4-Dichlorophenol 0.400 U mg/Kg EPA 8270 09/06 09/30 MTT 09/06 09/30 EPA 8270 1,2,4-Trichlorobenzene 0.400 U mg/Kg MTT 09/06 09/30 0.400 U **EPA 8270** MTT Naphthalene mg/Kg 0.400 EPA 8270 09/06 09/30 U MTT 4-Chloroaniline mg/Kg **EPA 8270** 09/06 09/30 0.400 U MTT Hexachlorobutadiene mg/Kg 09/06 09/30 U **EPA 8270** MTT 0.400 4-Chloro-3-Methylphenol mg/Kg **EPA 8270** 09/06 09/30 0.400 U MTT 2-Methylnaphthalene mg/Kg 0.400 **EPA** 8270 09/06 09/30 Hexachlorocyclopentadie U mq/Kq MIT 09/06 09/30 2,4,6-Trichlorophenol 0.400 U mg/Kg EPA 8270 MTT 2,4,5-Trichlorophenol 0.400 mq/Kq **EPA** 8270 09/06 09/30 MTT 0.400 **EPA** 8270 09/06 09/30 2-Chloronaphthalene mg/Kg (TT



COMMERCIAL TESTING & ENGINEERING CO. ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908		REPO	RT of ANALY	SIS SIA			
Chemlab Ref.# :93.4354-6			01 /	a	4 . /2	5633 B S1	
Client Sample ID :LAY-LF01-SD04	POIN	T LA	Y	(irs	al oi some	ANCHORAGE, AK TEL: (907) 56:	
Matrix :SOIL					V. / C.	FAX: (907) 56	1-5301
		M.,.b.1		. h	-	. ,	
2-Nitroaniline	0.400	Cumuy U	mg/Kg	EPA 8270		09/06 09/30	MUTT
	0.400	י ט					MTT
			mg/Kg	EPA 8270		09/06 09/30	MTT
	0.400	U	mg/Kg	EPA 8270		09/06 09/30	MTT
•	0.400	Ŭ	mg/Kg	EPA 8270		09/06 09/30	MTT
	0.400	U	mg/Kg	EPA 8270		09/06 09/30	MTT
	0.400	ប	mg/Kg	EPA 8270		09/06 09/30	\mathtt{MTT}
	0.400	υ·	mg/Kg	EPA 8270		09/06 09/30	MTT
	0.400	U	mg/Kg	EPA 8270		09/06 09/30	MTT
Dibenzofuran	0.400	U	mg/Kg	EPA 8270		09/06 09/30	MTT
2,4-Dinitrotoluene	0.400	U	mg/Kg	EPA 8270		09/06 09/30	MTT
Diethylphthalate	0.400	U	mg/Kg	EPA 8270		09/06 09/30	MTT
4-Chlorophenyl-Phenylet	0.400	U	mg/Kg	EPA 8270		09/06 09/30	MTT
	0.400	U	mg/Kg	EPA 8270		09/06 09/30	MTT
	0.400	Ü	mg/Kg	EPA 8270		09/06 09/30	MTT
	0.400	Ü	mg/Kg	EPA 8270		09/06 09/30	MTT
	0.400	Ü	mg/Kg	EPA 8270		09/06 09/30	MTT
	0.400	Ü		EPA 8270			
	0.400	Ü	mg/Kg			09/06 09/30	MTT
	0.400		mg/Kg	EPA 8270		09/06 09/30	MTT
		U	mg/Kg	EPA 8270		09/06 09/30	MTT
	0.400	U	mg/Kg	EPA 8270		09/06 09/30	MTT
	0.400	Ü	mg/Kg	EPA 8270	_ E I	09/06 09/30	MTT
• •	1.50	•	mg/Kg	EPA 8270 (U	.)- E. I	09/06 09/30	MTT
	0.400	U	mg/Kg	EPA 8270		09/06 09/30	MTT
	0.400-		mg/Kg	EPA 8270		09/06 09/30	MTT
	0.400	U	mg/Kg	EPA 8270		09/06 09/30	MTT
·	0.400	U	mg/Kg	EPA 8270		09/06 09/30	MTT
	0.400	U	mg/Kg	EPA 8270		09/06 09/30	MTT
Chrysene	0.400	Π^{C}	mg/Kg	EPA 8270	\	09/06 09/30	MTT
bis(2-Ethylhexyl)Phthal0.515-		- 0)	mg/Kg	EPA 8270 (W	1-6.2.	09/06 09/30	MTT
di-n-Octylphthalate	0.400	U	mg/Kg	EPA 8270		09/06 0 9 /30	MTT
Benzo(b)Fluoranthene	0.400	U	mg/Kg	EPA 8270		09/06 09/30	MTT
Benzo(k)Fluoranthene	0.400	U	mg/Kg	EPA 8270		09/06 09/30	MTT
Benzo(a)Pyrene	0.400	U	mg/Kg	EPA 8270		09/06 09/30	MTT
	0.400	U	mg/Kg	EPA 8270		09/06 09/30	MTT
	0.400	Ū	mg/Kg	EPA 8270		09/06 09/30	MTT
	0.400	Ü	mg/Kg	EPA 8270		09/06 09/30	MTT
2020 (5/, 2/. 02/200		Ŭ	g/ 1/g	LA 0270		03/00 03/30	1111
Sample Preparation			EP	A 3050 Diges	t		
Total Metals Analysis	~~~			_			
ICP Screen, ICF				EPA	n/a		
Aluminum	2400		mg/Kg	EPA 6010	11/ a	08/31 09/02	חבינ
Antimony	82	11 1	mg/Kg J.ろ				DFL
	82	נט		EPA 6010		08/31 09/02	DFL
Arsenic		U	mg/Kg	EPA 6010		08/31 09/02	DFL
Barium	260	••	mg/Kg	EPA 6010		08/31 09/02	DFL
Beryllium	41	Ü	mg/Kg	EPA 6010		08/31 09/02	DFL
Cadmium	41	Ü	mg/Kg	EPA 6010		08/31 09/02	DFL
Calcium	6300		mg/Kg	EPA 6010		08/31 09/02	DFL
Chromium	13		mg/Kg	EPA 6010		08/31 09/02	DFL
Cobalt	8.2	U	mg/Kg	EPA 6010		08/31 09/02	DFL
Copper	55		mg/Kg	EPA 6010		08/31 09/02	DFL
			- 1	(humal)			
			hriama	changer 510194			. 1
7			, λ.i	-: 104		Compiled &	W
			٧٠,١	$\mathcal{U}\mathcal{U}^{\gamma}$ \		Compour,	`
	_			- 1		Windlad	
@5 69	⊃ Mem	ber of t	he SGS Group (S	ociété Générale de l	Surveillance)	וייוושאי	
	00400 :						



ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908		REPORT of ANALY	ISIS SUCCESSION OF THE SECOND	cena p				
Chemlab Ref.# Client Sample ID Matrix	:93.4354-6	_1		5633 B ANCHORAGE, ANCHORAGE, ANCHORAGE, ANCHORAGE, ANCHORAGE, ANCHORAGE, BANCHORAGE, on Lead Magnesium Manganese Molybdenum Nickel Potassium Selenium Silver Sodium Thallium Vanadium Zinc	70000 18 1900 220 41 13 410 82 41 120 0.42 11 380	mg/Kg mg/Kg mg/Kg J mg/Kg J mg/Kg J mg/Kg U mg/Kg J mg/Kg U mg/Kg U mg/Kg J mg/Kg Mg/Kg Mg/Kg Mg/Kg Mg/Kg	EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 7841 EPA 6010 EPA 6010	08/31 09/02 DFI 08/31 09/02 DFI 08/31 09/02 DFI 08/31 09/02 DFI 08/31 09/02 DFI 08/31 09/02 DFI 08/31 09/02 DFI 08/31 09/02 DFI 08/31 09/02 DFI 08/31 09/02 DFI 08/31 09/02 DFI 08/31 09/02 DFI 08/31 09/02 DFI 08/31 09/02 DFI
TOC, Soil	15800	-	PSEP Ref Lab					

Mi Chays s. 2 2/3/94

See Special Instructions Above

** See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable

NA = Not Analyz

LT = Less Than

GT = Greater Than



SSS Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.#

:93.4354-8

REPORT of ANALYSIS

Client Sample ID :LAY-LF01-SD04 POINT LAY DUPLICATE

ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

5633 B STREET

Matrix

:SOIL

Client Name

:ICF KAISER ENGINEERING

WORK Order :70106

Ordered By Project Name :RAY MORRIS :DEW LINE RI/FS

Report Completed :10/07/93 Collected

Project#

:41096-412-01

:08/24/93 @ 15:15 hrs

PWSID :UA Received

:08/26/93 @ 12:00 hrs

Technical Director: STEPHEN C. EDE Released By : State C. 4

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C.

Paramete	er	Results	QC Qual	Units	Method	Allowable Limits		Anal Date	Init
Sample F	reparation				EPA 3050 Digest				
Total Me ICP Scre Aluminum Antimony Arsenic Barium Berylliu Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesiu Manganes Molybden Nickel Potassiu Selenium Silver Sodium Thallium Vanadium Zinc	m e um	1700 82 82 200 41 41 3900 10 8.2 43 58000 24 1000 170 41 8.6 410 82 41 110 0.42 5.4 320		mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	EPA EPA 6010	n/a	08/31 08/31 08/31 08/31 08/31 08/31 08/31 08/31 08/31 08/31 08/31 08/31	09/02	

See Special Instructions Above

** See Sample Remarks Above

= Undetected, Reported value is the practical quantification limit. = Secondary dilution.

NA = Not Analyzed LT = Less ThanGT = Greater Than

UA = Unavailable



Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.#

:93.4354-7

Client Sample ID :LAY-LF01-SD04 SPIKE Matrix

:SOIL

Client Name :ICF KAISER ENGINEERING Ordered By :RAY MORRIS

Project Name Project#

:DEW LINE RI/FS :41096-412-01

PWSID :UA REPORT of ANALYSIS

ANCHORAGE, AK 99518 TEL: (907) 562-23+3 FAX: (907) 561-5301

5533 B ST

WORK Order :70106 Report Completed :10/07/93

Collected :08/24/93 @ 15:15 hrs Received :08/26/93 3 12:00 hrs

Technical Director: STEPHEN C. EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. FOR SPIKE AND SPIKE DUPLICATE

RECOVERY AND RPD, SEE QC SUMMARY.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.528		mg/Kg	EPA 8260		00/06	00/12	177.114
Bromobenzene	0.050	U	mg/Kg	EPA 8260			09/13 09/13	KWM
Bromochloromethane	0.050	Ü	mg/Kg	EPA 8260				KWM
Bromodichloromethane	0.050	Ü	mg/Kg	EPA 8260			09/13	KWM
Bromoform	0.050	Ū	mg/Kg	EPA 8260			09/13 09/13	KWM
Bromomethane	0.050	Ü	mg/Kg	EPA 8260			09/13	KWM
n-Butylbenzene	0.050	U	mg/Kg	EPA 8260			09/13	KWH KWH
sec-Butylbenzene	0.050	U	mg/Kg	EPA 8260			09/13	RWIT
tert-Butylbenzne	0.050	U	mg/Kg	EPA 8260			09/13	M
Carbon Tetrachloride	0.050	U	mg/Kg	EPA 8260			09/13	КММ
Chlorobenzene	0.541		mg/Kg	EPA 8260		08/26		KWM
Chloroethane	0.050	U	mg/Kg	EPA 8260		08/26		KWM
Chloroform	0.050	U	mg/Kg	EPA 8260		08/26		KWM
Chloromethane	0.050	U	mg/Kg	EPA 8260		08/26		KWM
2-Chlorotoluene	0.050	Ŭ	mg/Kg	EPA 8260		08/26		KWM
4-Chlorotoluene	0.050	U	mg/Kg	EPA 8260		08/26		KWM
Dibromochloromethane	0.050	ับ	mg/Kg	EPA 8260		08/26		HWM
12Dibromo3Chloropropane	0.050	U	mg/Kg	EPA 8260		08/26		KWM
1,2-Dibromoethane	0.050	U	mg/Kg	EPA 8260		08/26		KWM
Dibromomethane	0.050	U	mg/Kg	EPA 8260		08/26		KWM
1,2-Dichlorobenzene	0.050	U	mg/Kg	EPA 8260		08/26		KWM
1,3-Dichlorobenzene	0.050	U	mg/Kg	EPA 8260		08/26		KWM
1,4-Dichlorobenzene	0.050	U	mg/Kg	EPA 8260		08/26		KWM
Dichlorodifluoromethane	0.050	U	mg/Kg	EPA 8260		08/26		KWM
1,1-Dichloroethane	0.050	U	mg/Kg	EPA 8260		08/26		KWM
1,2-Dichloroethane	0.050	U	mg/Kg	EPA 8260		08/26		KWM
1,1-Dichloroethene	0.084		mg/Kg	EPA 8260		08/26		KWM
cis-1,2-Dichloroethene	0.050	U	mg/Kg	EPA 8260		08/26		KWM
trans1,2-Dichloroethene	0.050		mg/Kg	EPA 8260		08/26		KWM
1,2-Dichloropropane	0.050		mg/Kg	EPA 8260		08/26		KWM
1,3-Dichloropropane	0.050		mg/Kg	EPA 8260		08/26		KWM
2,2-Dichloropropane	0.050		mg/Kg	EPA 8260		08/26		KWM
1,1-Dichloropropene Ethylbenzene	0.050		mg/Kg	EPA 8260		08/26		KWM
Hexachlorobutadiene	0.050		mg/Kg	EPA 8260		08/26	09/13	KWM
Isopropylbenzene	0.050		mg/Kg	EPA 8260		08/26	09/13	KWM
100b10bl1DellZelle	0.050	U	mg/Kg	EPA 8260		08/26	09/13	M





ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS Chemlab Ref.# :93.4354-7 5633 B STREET ANCHORAGE, AK 99518 Client Sample ID :LAY-LF01-SD04 SPIKE TEL: (907) 562-2343 Matrix :SOIL FAX: (907) 561-5301 p-Isopropyltoluene 0.050 11 mg/Kg EPA 8260 08/26 09/13 KW: Methylene Chloride 0.050 ü mg/Kg EPA 8260 08/26 09/13 KW: Napthalene 0.050 U EPA 8260 mq/Kq 08/26 09/13 KW: n-Propylbenzene 0.050 Ü ma/Ka EPA 8260 08/26 09/13 KWI Styrene 0.050 U mg/Kg EPA 8260 08/26 09/13 KWI 1112-Tetrachloroethane 0.050 U mg/Kg EPA 8260 08/26 09/13 KWI 1122-Tetrachloroethane 0.050 U EPA 8260 mg/Kg 08/26 09/13 KWI Tetrachloroethene 0.305 mg/Kg EPA 8260 08/26 09/13 KWI Toluene 0.594 mg/Kg EPA 8260 08/26 09/13 KWI 1,2,3-Trichlorobenzene 0.050 U mg/Kg EPA 8260 08/26 09/13 KWI 1,2,4-Trichlorobenzene 0.050 U mq/Kq 08/26 09/13 EPA 8260 KWI 1,1,1-Trichloroethane 0.050 U ma/Ka EPA 8260 08/26 09/13 KWI 1,1,2-Trichloroethane 0.050 U mg/Kg EPA 8260 08/26 09/13 KWI Trichloroethene 0.375 EPA 8260 mg/Kg 08/26 09/13 KWI Trichlorofluoromethane 0.050 U mg/Kq EPA 8260 08/26 09/13 KWI 1,2,3-Trichloropropane 0.050 mg/Kg EPA 8260 08/26 09/13 KWF 1,2,4-Trimethylbenzene 0.060 EPA 8260 mg/Kg 08/26 09/13 KWM 1,3,5-Trimethylbenzene 0.050 Ü mg/Kg EPA 8260 08/26 09/13 KWM Vinyl Chloride 0.050 mq/Kq EPA 8260 08/26 09/13 KHY p+m-Xylene 0.054 mg/Kg EPA 8260 08/26 09/13 KWM o-Xylene 0.050 U mg/Kg EPA 8260 08/26 09/13 KWK Semivolatile Organics EPA 8270 Phenol 2.58 mg/Kg EPA 8270 09/06 09/30 MTT bis(2-Chloroethyl)ether 0.400 U EPA 8270 09/06 09/30 mg/Kg MTT 2-Chlorophenol 2.44 mq/Kq **EPA** 8270 09/06 09/30 MTT 1,3-Dichlorobenzene 0.400 U mg/Kg EPA 8270 09/06 09/30 MTT 1,4-Dichlorobenzene 2.12 EPA 8270 mg/Kg 09/06 09/30 MTT Benzyl Alcohol 1.45 EPA 8270 mg/Kg 09/06 09/30 MTT 1,2-Dichlorobenzene 0.400 U EPA 8270 mg/Kg 09/06 09/30 MTT 2-Methylphenol 0.400 U EPA 8270 mg/Kg 09/06 09/30 MTT bis(2-Chloroisopropyl)e 0.400 mg/Kg EPA 8270 09/06 09/30 MTT 4-Methylphenol 0.400 EPA 8270 mg/Kg 09/06 09/30 MTT n-Nitroso-di-n-Propylam 2.82 mg/Kg EPA 8270 09/06 09/30 MTT Hexachloroethane 0.400 U **EPA 8270** mg/Kq 09/06 09/30 MTT Nitrobenzene 0.400 U **EPA** 8270 mg/Kq 09/06 09/30 MIT Isophorone 0.400 Ü ma/Ka EPA 8270 09/06 09/30 MTT 2-Nitrophenol 0.400 H mg/Kg EPA 8270 09/06 09/30 MTT 2,4-Dimethylphenol 0.400 U mq/Kq EPA 8270 09/06 09/30 MTT Benzoic Acid 0.400 U mg/Kq EPA 8270 09/06 09/30 MTT bis(2-Chloroethoxy)Meth 0.400 U mg/Kg EPA 8270 09/06 09/30 MTT 2,4-Dichlorophenol 0.400 U mg/Kg EPA 8270 09/06 09/30 MTT 1,2,4-Trichlorobenzene 2.66 mg/Kg EPA 8270 09/06 09/30 MIT Naphthalene 0.400 U EPA 8270 mg/Kg 09/06 09/30 MTT 4-Chloroaniline 0.400 U mg/Kg EPA 8270 09/06 09/30 MTT Hexachlorobutadiene 0.400 U mg/Kg EPA 8270 09/06 09/30 MTT 4-Chloro-3-Methylphenol 3.15 mg/Kg EPA 8270 09/06 09/30 MTT 2-Methylnaphthalene 0.400 mg/Kg EPA 8270 09/06 09/30 MTT Hexachlorocyclopentadie 0.400 U EPA 8270 mg/Kg 09/06 09/30 MTT 2,4,6-Trichlorophenol 0.400



0.400

2,4,5-Trichlorophenol

EPA 8270

EPA 8270

09/06 09/30

09/06 09/30

MTT

MTT

mg/Kg

mg/Kg



COMMERCIAL TESTING & ENGINEERING CO. ENVIRONMENTAL LABORATORY SERVICES

5 % 2 E 908						
Chemlab Ref.# :93.4354-7	RE	PORT of A	NALYSIS		56 33 B S	7
Client Sample ID :LAY-LF01-S	704 cnr.m				ANCHORAGE, AK S	9518
Matrix :SOIL	D04 SPIKE				TEL: (907) 562	
:501L					FAX: (907) 561	-5301
2-Chloronaphthalene	0 400	,,,				
2-Nitroaniline	0.400 U		EPA 8270		09/06 09/30	MT
Dimethylphthalate	0.400 U	3/ ••3	EPA 8270		09/06 09/30	MT
Acenaphthylene	0.400 U		EPA 8270		09/06 09/30	MT
2,6-Dinitrotoluene	0.400 U	5/ ••5	EPA 8270		09/06 09/30	MT
3-Nitroaniline	0.400 U	3/ ••3	EPA 8270		09/06 09/30	MT
Acenaphthene	0.400 U	3/ **3	EPA 8270		09/06 09/30	MT
2,4-Dinitrophenol	3.19	mg/Kg	EPA 8270		09/06 09/30	MT
4-Nitrophenol	0.400 U	3/ ••3	EPA 8270		09/06 09/30	MT
Dibenzofuran	3.03	mg/Kg	EPA 8270		09/06 09/30	MT
	0.400 U	3/ 113	EPA 8270		09/06 09/30	MTT
2,4-Dinitrotoluene	2.77	mg/Kg	EPA 8270		09/06 09/30	MTT
Diethylphthalate	0.400 U	37 413	EPA 8270		09/06 09/30	MTI
4-Chlorophenyl-Phenylet	0.400 U	5,	EPA 8270		09/06 09/30	MT
Fluorene	0.400 U	3/ ••5	EPA 8270		09/06 09/30	MTI
4-Nitroaniline	0.400 U	mg/Kg	EPA 8270		09/06 09/30	MTT
4,6-Dinitro-2-Methylphe	0.400 U	コノ・・コ	EPA 8270		09/06 09/30	MT
n-Nitrosodiphenylamine	0.400 U	2/ **3	EPA 8270		09/06 09/30	MTT
4-Bromophenyl-Phenyleth	0.400 U		EPA 8270		09/06 09/30	MTT
Hexachlorobenzene	0.400 U	mg/Kg	EPA 8270		09/06 09/30	MTI
Pentachlorophenol	2.22	mg/Kg	EPA 8270		09/06 09/30	MTT
Phenanthrene	0.400 U	2	EPA 8270		09/06 09/30	MTT
Anthracene	0.400 U	5/ **5	EPA 8270		09/06 09/30	MTT
di-n-Butylphthalate	3.40	mg/Kg	EPA 8270		09/06 09/30 📶	TTE
Fluoranthene	0.400 U	mg/Kg	EPA 8270		09/06 09/30	TT
Pyrene	2.98	mg/Kg	EPA 8270		09/06 09/30	MTT
Butylbenzylphthalate	0.400 U	mg/Kg	EPA 8270		09/06 09/30	MTT
3,3-Dichlorobenzidine	0.400 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Benzo(a)Anthracene	0.400 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Chrysene	0.400 U	mg/Kg	EPA 8270		09/06 09/30	MTT
bis(2-Ethylhexyl)Phthal	1.00 U	mg/Kg	EPA 8270		09/06 09/30	MTT
di-n-Octylphthalate	0.400 U	mg/Kg	EPA 8270		. 09/06 09/30	MTT
Benzo(b)Fluoranthene	0.400 U	mg/Kg	EPA 8270	•	09/06 09/30	MTT
Benzo(k)Fluoranthene	0.400 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Benzo(a)Pyrene	0.400 U	mg/Kg	EPA 8270		09/06 09/30	\mathtt{MTT}
Indeno(1,2,3-cd)Pyrene	0.400 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Dibenz(a,h)Anthracene	0.400 U		EPA 8270		09/06 09/30	MTT
Benzo(g,h,i)Perylene	0.400 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Sample Preparation			EPA 3050 Digest			
Total Metals Analysis			_			
ICP Screen. ICF			EPA	n/a		
Aluminum	2300	mg/Kg	EPA 6010		08/31 09/02	DFL
Antimony	130	mg/Kg	EPA 6010		08/31 09/02	DFL
Arsenic	190	mg/Kg	EPA 6010		08/31 09/02	DFL
Barium	430	mg/Kg	EPA 6010		08/31 09/02	DFL
Beryllium	75	mg/Kg	EPA 6010		08/31 09/02	DFL
Cadmium	92	mg/Kg	EPA 6010		08/31 09/02	DFL
Calcium	6400	mg/Kg	EPA 6010		08/31 09/02	DFL
Chromium	160	mg/Kg	EPA 6010		08/31 09/02	DFL
Cobalt	150	mg/Kg	EPA 6010		08/31 09/02	DFL
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ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS Chemlab Ref.# 5633 B STREET :93.4354-7 ANCHORAGE, AK 99518 Client Sample ID :LAY-LF01-SD04 SPIKE TEL: (907) 562-2343 Matrix :SOIL FAX: (907) 561-5301 Copper 210 mg/Kg EPA 6010 08/31 09/02 DFI Iron 71000 mg/Kg EPA 6010 08/31 09/02 DFT Lead 150 mg/Kg EPA 6010 08/31 09/02 DFI Magnesium 2800 mg/Kg EPA 6010 08/31 09/02 DFL Manganese 360 mg/Kg EPA 6010 08/31 09/02 DFL Molybdenum 170 mg/Kg EPA 6010 08/31 09/02 DFL Nickel 160 EPA 6010 mg/Kg 08/31 09/02 DFL Potassium 1800 EPA 6010 mg/Kg 08/31 09/06 DLG Selenium 240 mg/Kg EPA 6010 08/31 09/02 DFL Silver 41 U mg/Kg EPA 6010 08/31 09/02 DFL Sodium 1600 mg/Kg EPA 6010 08/31 09/06 DLG Thallium 3.4 EPA 7841 mg/Kg 08/30 09/01 KAW Vanadium 150 mg/Kg EPA 6010 08/31 09/02 DFL Zinc 530

mg/Kg

EPA 6010

See Sample Remarks Above

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed

08/31 09/02

DFL

LT = Less Than

GT = Greater Than



Member of the SGS Group (Société Générale de Surveillance)

See Special Instructions Above

U = Undetected, Reported value is the practical quantification limit.



ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.#

:93.4354-12

REPORT of ANALYSIS

5633 8 ANCHORAGE, AK 99518 TEL: (907) 562-2343

FAX: (907) 561-5301

Matrix

:SOIL

Client Sample ID :LAY-LF01-SD04 POINT LAY SPIKE DUPLICATE

Client Name Ordered By

:ICF KAISER ENGINEERING :RAY MORRIS

:70106

Project Name

:DEW LINE RI/FS

Report Completed :10/07/93

Project#

:41096-412-01

:08/24/93 @ 15:15

PWSID

Collected

:08/26/93

:UA

Received

WORK Order

@ 12:00 hr:

Technical Director: STEPHEN C. EDE Released By : STEPHEN C. Q

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C.

Parameter	QC Results Qua.	l Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics			EPA 8260				
Benzene	0.534	mg/Kg	EPA 8260		08/26	09/13	KWF
Bromobenzene	0.050 U	mg/Kg	EPA 8260			09/13	.KWF
Bromochloromethane	0.050 บ	mg/Kg	EPA 8260			09/13	KWM
Bromodichloromethane	0. 05 0 U	mg/Kg	EPA 8260			09/13	KWM
Bromoform	០.050 ប	mg/Kg	EPA 8260			09/13	KWM
Bromomethane	0 .0 50 U	mg/Kg	EPA 8260			09/13	KWM
n-Butylbenzene	0.050 U	mg/Kg	EPA 8260			09/13	KWM
sec-Butylbenzene	0.050 U	mg/Kg	EPA 8260			09/13	KWM
tert-Butylbenzne	0.050 U	mg/Kg	EPA 8260			09/13.	
Carbon Tetrachloride	0.050 - บ	mg/Kg	EPA 8260			09/13	WM
Chlorobenzene Chloroethane	0.562	mg/Kg	EPA 8260			09/13	KWM
Chloroform	0.050 U	mg/Kg	EPA 8260			09/13	KWM
	0. 0 50 U	mg/Kg	EPA 8260			09/13	KWM
Chloromethane	0.050 U	mg/Kg	EPA 8260			09/13	KWM
2-Chlorotoluene	0 .05 0 U	mg/Kg	EPA 8260			09/13	KWM
4-Chlorotoluene	0.050 บ	mg/Kg	EPA 8260			09/13	KWM
Dibromochloromethane	0.050 ช	mg/Kg	EPA 8260		08/26		KWM
12Dibromo3Chloropropane	0.050 ប	mg/Kg	EPA 8260		08/26		KWM
1,2-Dibromoethane	0.050 ប	mg/Kg	EPA 8260		08/26		KWM
Dibromomethane	0.050 ប	mg/Kg	EPA 8260		08/26		KWM
1,2-Dichlorobenzene	0 .050 U	mg/Kg	EPA 8260		08/26		KWM
1,3-Dichlorobenzene	0.050 ប	mg/Kg	EPA 8260		08/26		KWM
1,4-Dichlorobenzene	0.050 U	mg/Kg	EPA 8260		08/26		KWM
Dichlorodifluoromethane 1,1-Dichloroethane	0.050 U	mg/Kg	EPA 8260		08/26		KWM
1,1-Dichloroethane	0.050 U	mg/Kg	EPA 8260		08/26		KWM
1,1-Dichloroethene	0.050 U	mg/Kg	EPA 8260		08/26		KWM
cis-1,2-Dichloroethene	0.086	mg/Kg	EPA 8260		08/26		KWM
trans1,2-Dichloroethene	0.050 U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,2-Dichloropropane	0.050 U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,3-Dichloropropane	0.050 U	mg/Kg	EPA 8260		08/26	09/13	KWM
2,2-Dichloropropane	0.050 U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,1-Dichloropropene	0.050 U	mg/Kg	EPA 8260		08/26	09/13	KWM
Ethylbenzene	0.050 U	mg/Kg	EPA 8260		08/26	09/13	KWM
Hexachlorobutadiene	0.050 U	mg/Kg	EPA 8260		08/26		KWM
Isopropylbenzene	0.050 U	mg/Kg	EPA 8260		08/26		KWM
p-Isopropyltoluene	0.050 U	mg/Kg	EPA 8260		08/26		KWM
5 130broblicordelle	0.050 U	mg/Kg	EPA 8260		08/26		KWM
						4	





ENVIRONMENTAL LABORATORY SERVICES

	SINCE 1908					
	themlab Ref.# :93.4354-12	REF	ORT of ANA	ALYSIS X	caa D ST	DEST
	Client Sample ID :LAY-LF01-SD04	. DOTIM: r			56 33 B ST ANCHORAGE, AK !	
ì	Matrix :SOIL	F POINT L	AY SPIKE I	DUPLICATE	TEL: (907) 562	
•	MCTIX :501L				FAX: (907) 561	-5301
	Methylene Chloride	0 050	4			
	Napthalene	0.050 U	mg/Kg	EPA 8260	08/26 09/13	KWM
	n-Propylbenzene	0.050 U	mg/Kg	EPA 8260	08/26 09/13	KWM
	Styrene	0.050 U	mg/Kg	EPA 8260	08/26 09/13	KWM
	1112-Tetrachloroethane	0.050 U	mg/Kg	EPA 8260	08/26 09/13	KWH
	1122-Tetrachloroethane	0.050 U	mg/Kg	EPA 8260	08/26 09/13	KWM
	Tetrachloroethene	0.050 U	m g∕ Kg	EPA 8260	08/26 09/13	KWM
	Toluene	0.291	m g/K g	EPA 8260	08/26 09/13	KWM
		0.609	mg/Kg	EPA 8260	08/26 09/13	KWM
	1,2,3-Trichlorobenzene	0.050 U	m g/K g	EPA 8260	08/26 09/13	KWM
	1,2,4-Trichlorobenzene	0.050 U	mg/Kg	EPA 8260	08/26 09/13	KWM
	1,1,1-Trichloroethane	0.050 ប	mg/Kg	EPA 8260	08/26 09/13	KWM
	1,1,2-Trichloroethane	0.050 U	mg/Kg	EPA 8260	08/26 09/13	KWM
	Trichloroethene	0.384	mg/Kg	EPA 8260	08/26 09/13	KWM
	Trichlorofluoromethane	0.050 U	m g/ Kg	EPA 8260	08/26 09/13	KWM
	1,2,3-Trichloropropane	0.050 U	mg/Kg	EPA 8260	08/26 09/13	KWM
	1,2,4-Trimethylbenzene	0.050 U	mg/Kg	EPA 8260	08/26 09/13	
	1,3,5-Trimethylbenzene	0.050 U	mg/Kg	EPA 8260		KWM
	Vinyl Chloride	0.050 U	mg/Kg	EPA 8260	08/26 09/13	KWM
	p+m-Xylene	0.050 U	mg/Kg	EPA 8260	08/26 09/13	KWM
	o-Xylene	0.050 U	mg/Kg	EPA 8260	08/26 09/13	KWM
				 0200	08/26 09/13	KWM
	Semivolatile Organics			EPA 8270		
	Phenol	2.04	mg/Kg	EPA 8270	00/06 00/00	N/CDCD
	bis(2-Chloroethyl)ether	0.400 ÷ U	mg/Kg	EPA 8270	09/06 09/30	MTT
	2-Chlorophenol	1.93	mg/Kg	EPA 8270	09/06 09/30	MTT
	1,3-Dichlorobenzene	0.400 U	mg/Kg	EPA 8270	09/06 09/30	MTT
	1,4-Dichlorobenzene	1.67	mg/Kg	EPA 8270	09/06 09/30	HTT
	Benzyl Alcohol	1.08	mg∕ Kg	EPA 8270	09/06 09/30	MTT
	1,2-Dichlorobenzene	0.400 U	mg/Kg	EPA 8270	09/06 09/30	MTT
	^ ** ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' '	0.400 U	mg/Kg	EPA 8270	09/06 09/30	MTT
		0.400 U	mg/Kg	EPA 8270	09/06 09/30	MTT
	4 44 1 7 3 4	0.400 U	mg/Kg		09/06 09/30	MTT
	n-Nitroso-di-n-Propylam	2.26	mg/Kg	EPA 8270	09/06 09/30	MTT
	••	0.400 U	m g ∕Kg	EPA 8270	09/06 09/30	MTT
		0.400 U	m g∕K g	EPA 8270	09/06 09/30	MTT
		0.400 U	mg/Kg	EPA 8270	09/06 09/30	MTT
	7 11:4	0.400 U		EPA 8270	09/06 09/30	MTT
	8 4 - 4	0.400 U	mg/Kg	EPA 8270	09/06 09/30	MTT
	n	0.400 U	mg/Kg	EPA 8270	09/06 09/30	MTT
		0.400 U	mg/Kg	EPA 8270	09/06 09/30	MTT
	0 4 m • • • • • • •	0.400 U	mg/Kg	EPA 8270	09/06 09/30	MTT
	1,2,4-Trichlorobenzene	2.11	mg/Kg	EPA 8270	09/06 09/30	MTT
	11 . 1 . 1 . 7		mg/Kg	EPA 8270	09/06 09/3 0	MTT
	4 61 3		mg/Kg	EPA 8270	09/06 09/30	MTT
	77	0.400 U 0.400 U	mg/Kg	EPA 8270	09/06 09/30	HTT
	4-Chloro-3-Methylphenol	2.67	mg/Kg	EPA 8270	09/06 09/30	MTT
			mg/Kg	EPA 8270	09/06 09/30	MTT
	11		mg/Kg	EPA 8270	09/06 09/30	MTT
	0 4 6 m + + + +		mg/Kg	EPA 8270	09/06 09/30	MTT
	7 4 5 6 1 1 1 1 1 1		mg/Kg	EPA 8270	09/06 09/30	MTT
	2 (5)	0.400 U	mg/Kg	EPA 8270	09/06 09/30	MTT
		0.400 U	mg/Kg	EPA 8270	09/06 09/30	MTT
-						





ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS Chemlab Ref.# :93.4354-12

5633 B ST ANCHORAGE, AK 99518 TEL: (907) 562-2343

Client Sample ID :LAY-LF01- Matrix :SOIL		AY SPIKE	DUPLICATE	ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301
2-Nitroaniline	0.400 U	mg/Kg	EPA 8270	09/06 09/30 MTT
Dimethylphthalate	0.400 U	mg/Kg	EPA 8270	09/06 09/30 MTT
Acenaphthylene	0.400 U	mg/Kg	EPA 8270	09/06 09/30 MTT
2,6-Dinitrotoluene	0.400 U	mg/Kg	EPA 8270	09/06 09/30 MTT
3-Nitroaniline	0.400 U	mg/Kg	EPA 8270	09/06 09/30 MTT
Acenaphthene	2.68	mg/Kg	EPA 8270	09/06 09/30 MTT
2,4-Dinitrophenol	0.400 U	mg/Kg	EPA 8270	09/06 09/30 MTT
4-Nitrophenol	2.91	mg/Kg	EPA 8270	09/06 09/30 MTT
Dibenzofuran	0.400 U	mg/Kg	EPA 8270	09/06 09/30 MTT
2,4-Dinitrotoluene	2.42	mg/Kg	EPA 8270	09/06 09/30 MTT
Diethylphthalate	0.400 U	mg/Kg	EPA 8270	09/06 09/30 MTT
4-Chlorophenyl-Phenylet	0.400 U	mg/Kg	EPA 8270	09/06 09/30 MTT
Fluorene	0.400 U	mg/Kg	EPA 8270	09/06 09/30 MTT
4-Nitroaniline	0.400 U	mg/Kg	EPA 8270	09/06 09/30 MTT
4,6-Dinitro-2-Methylphe	0.400 U	mg/Kg	EPA 8270	09/06 09/30 MTT
n-Nitrosodiphenylamine	0.400 U	mg/Kg	EPA 8270	09/06 09/30 MTT
4-Bromophenyl-Phenyleth	0.400 U	mg/Kg	EPA 8270	09/06 09/30 MTT
Hexachlorobenzene	0.400 U	mg/Kg	EPA 8270	09/06 09/30 MTT
Pentachlorophenol	2.60	mg/Kg	EPA 8270	09/06 09/30 MTT
Phenanthrene	0.400 U	mg/Kg	EPA 8270	09/06 09/30 MTT
Anthracene	0.400 U	mg/Kg	EPA 8270	09/06 09/30 MTT
di-n-Butylphthalate	3.29	mg/Kg	EPA 8270	09/06 09/30 MTT
Fluoranthene	0.400 U	mg/Kg	EPA 8270	09/06 09/30 MTT
Pyrene	2.61	mg/Kg	EPA 8270	09/06 09/30 T
Butylbenzylphthalate	0.400 U	mg/Kg	EPA 8270	09/06 09/30 TIT
3,3-Dichlorobenzidine	0.400 U	mg/Kg	EPA 8270	09/06 09/30 MTT
Benzo(a)Anthracene	0.400 U	mg/Kg	EPA 8270	09/06 09/30 MTT
Chrysene	0.400 U	mg/Kg	EPA 8270	09/06 09/30 MTT
bis(2-Ethylhexyl)Phthal	1.00 U	mg/Kg	EPA 8270	09/06 09/30 MTT
di-n-Octylphthalate	0.400 U	mg/Kg	EPA 8270	09/06 09/30 MTT
Benzo(b)Fluoranthene	0.400 U	m g/K g	EPA 8270	09/06 09/30 MTT
Benzo(k)Fluoranthene	0.400 U	mg/Kg	EPA 8270	09/06 09/30 MTT
Benzo(a)Pyrene	0.400 U	mg/Kg	EPA 8270	09/06 09/30 MTT
Indeno(1,2,3-cd)Pyrene	0.400 U	mg/Kg	EPA 8270	09/06 09/30 MTT
Dibenz(a,h)Anthracene	0.400 U	mg/Kg	EPA 8270	09/06 09/30 MTT
Benzo(g,h,i)Perylene	0.400 U	m g/K g	EPA 8270	09/06 09/30 MTT

See Sample Remarks Above

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzeg

LT = Less Than

GT = Greater Than



Member of the SGS Group (Société Générale de Surveillance)

See Special Instructions Above

U = Undetected, Reported value is the practical quantification limit.



ENVIRONMENTAL LABORATORY SERVICES

lab Ref.# :93.4356-13 REPORT OF ANALYSIS

Client Sample ID :LAY-LF01-SD08 POINT LAY

Matrix :SOIL

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

Client Name

:ICF KAISER ENGINEERING

Ordered By Project Name :RAY MORRIS :DEW LINE RI/FS

Project# **PWSID**

:41096-412-01

:UA

WORK Order :70116

Report Completed :10/06/93

@ 15:20 hrs. Collected :08/24/93 :08/26/93 @ 12:00 hrs. Received

Technical Director: STAPHEN C. EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON. 8270 ANALYSIS

NOT RUN DUE TO HOLDING TIME BEING EXCEEDED.

Parameter	Results	QC Ougl	Unite	Method	Allowable Limits	Ext. Date	Anal Date	Init
	wesarrs		UNITES	nethod			Date	
Volatile Organics				EPA 8260				
Benzene	0.025	U	mg/Kg	EPA 8260			09/04	SGM
Bromobenzene	0.025	Ü	mg/Kg	EPA 8260		08/26	09/04	SGM
Bromochloromethane	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
Bromodichloromethane	0.025	ប	mg/Kg	EPA 8260		08/26	09/04	SGM
Bromoform	0.025	U	mg/Kg	EPA 8260		08/26	09/04	SGM
Bromomethane	0.025	U	mg/Kg	EPA 8260		•	09/04	SGM
n-Butylbenzene	0.025	บ	mg/Kg	EPA 8260		08/26		SGM
sec-Butylbenzene	0.025	U	mg/Kg	EPA 8260		08/26		SGM
rt-Butylbenzne	0.025	Ü	mg/Kg	EPA 8260		08/26		SGM
irbon Tetrachloride	0.025	U	mg/Kg	EPA 8260		08/26		SGM
Chlorobenzene	0.025	Ū	mg/Kg	EPA 8260		08/26		SGM
Chloroethane	0.025	Ū	mg/Kg	EPA 8260		08/26		SGM
Chloroform	0.025	Ū	mg/Kg	EPA 8260			09/04	SGM
Chloromethane	0.025	Ū	mg/Kg	EPA 8260			09/04	SGM
2-Chlorotoluene	0.025	Ü	mg/Kg	EPA 8260			09/04	
4-Chlorotoluene	0.025	Ū	mg/Kg	EPA 8260			09/04	SGM
Dibromochloromethane	0.025	Ū	mg/Kg	EPA 8260		08/26		SGM
12Dibromo3Chloropropane	0.025	Ü	mg/Kg	EPA 8260		08/26		SGM
1,2-Dibromoethane	0.025	U	mg/Kg	EPA 8260			09/04	SGM
Dibromomethane	0.025	U	mg/Kg	EPA 8260			09/04	SGM
1,2-Dichlorobenzene	0.025	U	mg/Kg	EPA 8260			09/04	SGM
1,3-Dichlorobenzene	0.025	U	mg/Kg	EPA 8260		08/26		SGM
1,4-Dichlorobenzene	0.025	U	mg/Kg	EPA 8260		08/26		SGM
Dichlorodifluoromethane	0.025	Ū	mg/Kg	EPA 8260		08/26		SGM
1,1-Dichloroethane	0.025	U	mg/Kg	EPA 8260			09/04	SGM
1,2-Dichloroethane	0.025	Ū	mg/Kg	EPA 8260			09/04	SGM
1,1-Dichloroethene	0.025	Ü	mg/Kg	EPA 8260			09/04	SGM
cis-1,2-Dichloroethene	0.025	Ü	mg/Kg	EPA 8260			09/04	SGM
trans1,2-Dichloroethene	0.025	Ū	mg/Kg	EPA 8260			09/04	SGM
1,2-Dichloropropane	0.025	ū	mg/Kg	EPA 8260		08/26		SGM
1,3-Dichloropropane	0.025	Ü	mg/Kg	EPA 8260		08/26		SGM
2,2-Dichloropropane	0.025	Ŭ	mg/Kg	EPA 8260		08/26		SGM
1,1-Dichloropropene	0.025	Ū	mg/Kg	EPA 8260		08/26		SGM
Ethylbenzene	0.025	Ŭ	mg/Kg	EPA 8260		08/26		SGM
Hexachlorobutadiene	0.025	Ū	mg/Kg	EPA 8260		08/26		SGM
Isopropylbenzene	0.025	Ü	mg/Kg	EPA 8260		08/26		SGM





ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS SET Chemlab Ref.# 5633 B STREET :93.4356-13 ANCHORAGE, AK 99518 Client Sample ID :LAY-LF01-SD08 POINT LAY TEL: (907) 562-2343 Matrix :SOIL FAX: (907) 561-5301 p-Isopropyltoluene 0.025 U mg/Kg **EPA** 8260 08/26 09/04 SGM Methylene Chloride 0.025 U ma/Ka **EPA** 8260 08/26 09/04 SGM Napthalene 0.025 U mg/Kg **EPA** 8260 08/26 09/04 SGM n-Propylbenzene 0.025 U ma/Ka **EPA** 8260 08/26 09/04 SGM Styrene 0.025 U EPA 8260 ma/Ka 08/26 09/04 SGM 1112-Tetrachloroethane 0.025 U EPA 8260 08/26 09/04 mg/Kg SGM 1122-Tetrachloroethane 0.025 u EPA 8260 08/26 09/04 mg/Kg SGM Tetrachloroethene 0.622 EPA 8260 mg/Kg 08/26 09/04 SGM Toluene 0.025 mg/Ka U EPA 8260 08/26 09/04 SGM 1,2,3-Trichlorobenzene 0.025 U mg/Kg EPA 8260 08/26 09/04 SGM 1.2.4-Trichlorobenzene 0.025 U mg/Kg **EPA** 8260 08/26 09/04 SGM 1.1.1-Trichloroethane 0.025 U mg/Kg **EPA** 8260 08/26 09/04 SGM 1.1.2-Trichloroethane 0.025 U EPA 8260 08/26 09/04 mg/Kg SGM Trichloroethene 0.025 U mg/Kg EPA 8260 08/26 09/04 SGM Trichlorofluoromethane 0.025 11 EPA 8260 08/26 09/04 SGM mg/Kg 1,2,3-Trichloropropane 0.025 mg/Kg EPA 8260 08/26 09/04 SGM 1.2.4-Trimethylbenzene 0.057 EPA 8260 mg/Kg 08/26 09/04 SGM 1,3,5-Trimethylbenzene 0.050 mg/Kg EPA 8260 08/26 09/04 SGM Vinyl Chloride 0.025 U mg/Kg **EPA** 8260 08/26 09/04 SGM p+m-Xylene 0.025 U mg/Kg **EPA** 8260 08/26 09/04 SGM o-Xylene 0.025 EPA 8260 08/26 09/04 mg/Kg SGM Sample Preparation EPA 3050 Digest Total Metals Analysis ICP Screen, ICF EPA n/a Aluminum 2200 ma/Ka **EPA** 6010 09/16 09/20 DLG Antimony 56 U mg/Kg EPA 6010 09/16 09/20 DLG Arsenic 56 U mq/Kq **EPA** 6010 09/16 09/20 DLG Barium 190 ma/Ka EPA 6010 09/16 09/20 DLG Beryllium 28 U 09/16 09/20 mq/Kq EPA 6010 DLG Cadmium 28 H ma/Ka EPA 6010 09/16 09/20 DLG Calcium 2600 EPA 6010 09/16 09/20 mq/Kq DLG Chromium 5.1 EPA 6010 09/16 09/20 mg/Kg DLG Cobalt 5.6 U mg/Kg **EPA** 6010 09/16 09/20 DLG Copper 16 mg/Kg EPA 6010 09/16 09/20 DLG Iron 19000 mg/Kg EPA 6010 09/16 09/20 DLG Lead 5.6 U EPA 6010 09/16 09/20 DLG mg/Kg Magnesium 1500 **EPA** 6010 09/16 09/20 DLG mg/Kg Manganese 180 EPA 6010 09/16 09/20 DLG mg/Kg Molybdenum EPA 6010 2.8 IJ 09/16 09/20 DLG mg/Kg Nickel 13 **EPA** 6010 09/16 09/20 DLG mg/Kg Potassium 280 **EPA** 6010 09/16 09/21 DFL mg/Kg Selenium 56 U mg/Kg EPA 6010 09/16 09/20 DLG Silver 2.8 U mq/Kq **EPA** 6010 09/16 09/20 DLG Sodium 75 mg/Kg EPA 6010 09/16 09/21 DFL Thallium 0.29 mg/Kg EPA 7841 09/16 09/17 BMW Vanadium 11 **EPA** 6010 09/16 09/20 DLG mg/Kg Zinc 125 **EPA** 6010 09/16 09/20 DLG mg/Kg TOC, Soil 28400 mg/Kg PSEP Ref Lab





ENVIRONMENTAL LABORATORY SERVICES

mlab Ref.#

REPORT of ANALYSIS

. 5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343

FAX: (907) 561-5301

:93.4356-15

Client Sample ID :LAY-LF01-SD08 POINT LAY DUPLICATE

Matrix :SOIL

Client Name

:ICF KAISER ENGINEERING

Ordered By

:RAY MORRIS

Project Name Project#

:DEW LINE RI/FS :41096-412-01

PWSID

:UA

WORK Order

:70116

Report Completed Collected

:10/06/93

:08/24/93 @ 15:20 hrs. :08/26/93 @ 12:00 hrs.

Received

Technical Director: STEPHEN C. EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON.

	Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
	Sample Preparation				EPA 3050 Digest				
	Total Metals Analysis				-				
	ICP Screen, ICF				EPA	n/a			
	Aluminum	2600		mg/Kg	EPA 6010		09/16	09/20	DLG
	Antimony	56	U	mg/Kg	EPA 6010		09/16	09/20	DLG
	Arsenic	56	U	mg/Kg	EPA 6010		09/16	09/20	DLG
	Barium	280		mg/Kg	EPA 6010		09/16	09/20	DLG
	Beryllium	28		mg/Kg	EPA 6010		09/16	09/20	DLG
	Cadmium	2.8	U	mg/Kg	EPA 6010		09/16	09/20	DLG
_	Calcium	3100		mg/Kg	EPA 6010		09/16	09/20	DLG
	Shromium	6.2		mg/Kg	EPA 6010		09/16	09/20	DLG
N.	bbalt	5.6	U	mg/Kg	EPA 6010		09/16	09/20	DLG
	Copper	17		mg/Kg	EPA 6010		09/16	09/20	DLG
	Iron	19000		mg/Kg	EPA 6010		09/16	09/20	DLG
	Lead	5.7		mg/Kg	EPA 6010		09/16	09/20	DLG
	Magnesium	1600		mg/Kg	EPA 6010	4	09/16	09/20	DLG
	Manganese	190		mg/Kg	EPA 6010		09/16	09/20	DLG
	Molybdenum	2.8		mg/Kg	EPA 6010		09/16	09/20	DLG
	Nickel	14		mg/Kg	EPA 6010		09/16	09/20	DLG
	Potassium	340		mg/Kg	EPA 6010		09/16	09/21	DFL
	Selenium	56	U	mg/Kg	EPA 6010		09/16	09/20	DLG
	Silver	2.8		mg/Kg	EPA 6010		09/16	09/20	DLG
	Sodium	82		mg/Kg	EPA 6010		09/16	09/21	DFL
	Thallium	0.29	U	mg/Kg	EPA 7841		09/16	09/17	BMW
	Vanadium	12		mg/Kg	EPA 6010		09/16	09/20	DLG
	Zinc	140		mg/Kg	EPA 6010		09/16	09/20	DLG

See Special Instructions Above

See Sample Remarks Above

Undetected, Reported value is the practical quantification limit. = Secondary dilution.

LT = Less Than GT = Greater Than

UA = Unavailable

NA = Not Analyzed



Member of the SGS Group (Société Générale de Surveillance)



REPORT of ANALYSIS

ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.#

:93.4356-14

Client Sample ID :LAY-LF01-SD08 POINT LAY SPIKE

Matrix

:SOIL

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

Client Name

:ICF KAISER ENGINEERING

Ordered By

:RAY MORRIS

Project Name Project#

:DEW LINE RI/FS :41096-412-01

PWSID

:UA

WORK Order

:70116

311 ---- bla Fut

Report Completed :10/06/93 Collected

:08/24/93

@ 15:20 :08/26/93 @ 12:00 hrs.

Received Technical Director: STEPHEN C. EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON.

00

		QC			Allowable	Ext.	Anal	
 Parameter	Results		Units	Method	Limits	Date	Date	Init
Sample Preparation				EPA 3050 Digest				
Total Metals Analysis				_				
ICP Screen, ICF				EPA	n/a			
Aluminum	3250		mg/Kg	EPA 6010		09/16	09/20	DLG
Antimony	1000		mg/Kg	EPA 6010		09/16	09/20	DLG
Arsenic	100		mg/Kg	EPA 6010		09/16	09/20	DLG
Barium	350		mg/Kg	EPA 6010		09/16	09/20	DLG
Beryllium	440		mg/Kg	EPA 6010		09/16	09/20	DLG
Cadmium	45		mg/Kg	EPA 6010		09/16	09/20	DLG
Calcium	4400		mg/Kg	EPA 6010		09/16	09/20	DLG
Chromium	110		mg/Kg	EPA 6010		09/16	09/20	DI
Cobalt	100		mg/Kg	EPA 6010		09/16	09/20	DL
Copper	120		mg/Kg	EPA 6010		09/16	09/20	DLG
Iron	30000		mg/Kg	EPA 6010		09/16	09/20	DLG
Lead	100		mg/Kg	EPA 6010		09/16	09/20	DLG
Magnesium	2750		mg/Kg	EPA 6010		09/16	09/20	DLG
Manganese	300		mg/Kg	EPA 6010		09/16	09/20	DLG
Molybdenum	97		mg/Kg	EPA 6010			09/20	DLG
Nickel	110		mg/Kg	EPA 6010 _			09/20	DLG
Potassium	1320		mg/Kg	EPA 6010			09/21	DFL
Selenium	1100		mg/Kg	EPA 6010		09/16	09/20	DLG
Silver	13		mg/Kg	EPA 6010		09/16	09/20	DLG
Sodium	1080		mg/Kg	EPA 6010		-	09/21	DFL
Thallium	2.45		mg/Kg	EPA 7841			09/17	BMW
Vanadium	110		mg/Kg	EPA 6010			09/20	DLG
Zinc	250		mg/Kg	EPA 6010		09/16	09/20	DLG

See Special Instructions Above

See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed

LT = Less Than

GT = Greater Than



Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

00

Chemlab Ref.# Client Sample ID :LAY-LF01-2SD12

:93.4692-11

Matrix

:SOIL

5633 B STREET ANCHORAGE, AK 99518

TEL: (907) 562-2343 FAX: (907) 561-5301

Client Name

:ICF KAISER ENGINEERING

Ordered By Project Name

:SHERI K ACE :DEW LINE RI/FS

Project#

:41096-412-01

PWSID

:UA

WORK Order

:70792

Report Completed :10/01/93

Collected Received

:09/07/93 @ 17:30 hrs

:09/09/93 @ 12:00 hrs

Technical Director: STEPHEN C. EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA.

Parameter	Results	QC Qual	. Units	Method	Allowable Limits	Ext. Date	Anal Date	In it
Percent Solids	88.6		*	SM17 2540G				
Hydrocarbons VPH	1.73		mg∕Kg				09/10	EAL
Hydrocarbons EPH	4.00	• • •	mg/Kg	EPA 5030/8015M		09/10	09/15	WLS
		3	"d\vd	3510/3550/8100M		09/14	09/17	JB H
Volatile Organics				FB\$ 0260				
Benzene	0.020	IJ	ma /Ka	EPA 8260				
Bromodenzene	0.020	Ü	mg/Kg mg/Kg	EPA 8260		09/16	09/28	KWM
Bromochloromethane	0.020	U		EFA 8260		09/16	09/28	KWM
Bromodichloromethane	0.020	Ü	mg/Kg	EPA 8260		09/16	09/28	KWM
Bromoform	0.020	Ü	mg/Kg	EPA 8260		09/16	09/28	KWM
Bromomethane	0.020	Ŭ	mg/Kg	EPA 8260		09/16	09/28	KWM
n-Butylbenzene	0.020	Ü	mg/Kg	EPA 8260		09/16	09/28	KWM
sec-Butylbenzene	0.020	Ü	mg/Kg	EPA 8260		09/16	09/28	KWM
tert-Butylbenzne	0.020	Ü	mg/Kg	EPA 8260		09/16	09/28	KWM
Carbon Tetrachloride	0.020	Ü	mg/Kg	EPA 8260		09/16	09/28	KWM
Chlorobenzene	0.020	Ü	mg/Kg	EPA 8260		09/16	09/28	KWM
Chloroethane	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
Chloroform	0.020	-	mg/Kg	EPA 8260		09/16	09/28	KWM
Chloromethane	0.020	U U	mg/Kg	EPA 8260		09/16	09/28	KWM
2-Chlorotoluene	0.020		mg/Kg	EPA 8260		09/16	09/28	KWM
4-Chlorotoluene	0.020	IJ	mg/Kg	EPA 8260		09/16	09/28	KWH
Dibromochloromethane	0.020	U	mg/Kg	EPA 8260		09/16	09/28	KWM
12Dibromo3Chloropropane	0.020	U	mg/Kg	EPA 8260		09/16		KWM
1,2-Dibromoethane	0.020	Ü	mg/Kg	EPA 8260		09/16	09/28	KWM
Dibromomethane	0.020	U	mg/Kg	EPA 8260		09/16		KWM
1,2-Dichlorobenzene	0.020	Ü	mg/Kg	EPA 8260		09/16		KWM
1,3-Dichlorobenzene	0.020	Ü	mg/Kg	EPA 8260		09/16		KWM
1,4-Dichlorobenzene	0.020		mg/Kg	EPA 8260		09/16		KWM
Dichlorodifluoromethane	0.020		mg/Kg	EPA 8260		09/16	09/28	KWM
1,1-Dichloroethane	0.020		mg/Kg	EPA 8260		09/16		KWM
1,2-Dichloroethane	0.020		mg/Kg	EPA 8260		09/16		KWM
1,1-Dichloroethene	0.020		mg/Kg	EPA 8260		09/16	09/28	KWM
cis-1,2-Dichloroethene			mg/Kg	EPA 8260		09/16		KWM
trans1,2-Dichloroethene	0.020 0.020		mg/Kg	EPA 8260		09/16		KWM
1,2-Dichloropropane	0.020		mg/Kg	EPA 8260		09/16		KWM
1,3-Dichloropropane			mg/Kg	EPA 8260		09/16	09/28	KWM
2,2-Dichloropropane	0.020		mg/Kg	EPA 8260		09/16		KWM
1,1-Dichloropropene	0.020		mg/Kg	EPA 8260		09/16		KWM
	0.020	U	mg/Kg	EPA 8260		09/16		KWM
							· · · - ·	



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4692-11 Client Sample ID :LAY-LF01-2SD12

Matrix :SOIL

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

				· ··×: (301) 301-3301
Ethylbenzene Hexachlorobutadiene Isopropylbenzene p-Isopropyltoluene Methylene Chloride Napthalene n-Propylbenzene Styrene 1112-Tetrachloroethane 1122-Tetrachloroethane Tetrachloroethene Toluene 1,2,3-Trichlorobenzene 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichloroethene Trichloroethene Trichlorofluoromethane 1,2,3-Trichloropropane 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene Vinyl Chloride p+m-Xylene o-Xylene	0.020 U mg 0.020 U mg	g/Kg EPA g/Kg EPA g/Kg EPA g/Kg EPA g/Kg EPA g/Kg EPA g/Kg EPA g/Kg EPA g/Kg EPA g/Kg EPA g/Kg EPA g/Kg EPA g/Kg EPA g/Kg EPA g/Kg EPA g/Kg EPA g/Kg EPA g/Kg EPA g/Kg EPA	8260 09, 826	/16 09/28 KWI /1
-	סבטייט מק	/Kg EPA		16 09/28 KWM

See Special Instructions Above

** See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit. D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed LT = Less Than

GT = Greater Than



Member of the SGS Group (Société Générale de Surveillance)



REPORT OF ANALYSIS

ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.#

:93.4692-12

Client Sample ID :LAY-LF01-2SD13 Matrix

:SOIL

5633 B STREET ANCHORAGE, AK 99513

TEL: (907) 562-2343 FAX: (907) 561-5301

Client Name

:ICF KAISER ENGINEERING

Ordered By Project Name

:SHERI K ACE :DEW LINE RI/FS

Project# PWSID

:41096-412-01 :UA

WORK Order

:70792

Report Completed :10/01/93

3 17:45 hrs

Collected Received

:09/07/93 :09/09/93

@ 12:00 hrs

Technical Director:STEPHEN C. EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA. EPH PATTERN IS NOT CONSISTENT

WITH UNWEATHERED MIDDLE DISTILLATE FUEL.

 Parameter	Results	QC Qual	. Units	Method	Allowable Limits	Ext. Date	Anal Date	In it
Percent Solids	37.6							11110
Hydrocarbons VPH	2.75		95	SM17 2540G			09/10	EAL
Hydrocarbons EPH	624		mg/Kg			09/10	09/15	WLS
	024		mg/Kg	3510/3550/8100M		09/14	09/19	JBH
Volatile Organics							/	0 511
Benzene	0.130			EPA 8260				
Bromobenzene	0.130		mg/Kg	EPA 8260		09/10	09/28	KWH
Bromochloromethane	0.130	Ü	mg/Kg	EPA 8260		09/10	09/28	KWH
Bromodichloromethane	0.130	Ü	mg/Kg	EPA 8260		09/10	09/28	KWH
Bromoform	0.130	Ü	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromomethane	0.130	Ü	mg/Kg	EPA 8260		09/10	09/28	KWM
n-Butylbenzene		Ü	mg/Kg	EPA 8260		09/10	09/28	KWM
sec-Butylbenzene	0.130	U	mg/Kg	EPA 8260		09/10		KWH
tert-Butvlbenzne	0.130	Ü	mg/Kg	EPA 8260		09/10	09/28	KWM
Carbon Tetrachloride	0.130	Ü	mg/Kg	EPA 8260		09/10	09/20	KWH
Chlorobenzene	0.130	Ü	mg/Kg	EPA 8260		09/10	09/28	KWM
Chloroethane	0.130	Ü	mg/Kg	EPA 8260		09/10	09/20	KWH
Chloroform	0.130	Ü	mg/Kg	EPA 8260		09/10	09/20	
Chloromethane	0.130	ប	mg/Kg	EPA 8260		09/10	09/28	KW H KWH
2-Chlorotoluene	0.130	U	mg/Kg	EPA 8260		09/10	09/20	
4-Chlorotoluene	0.130		mg/Kg	EPA 8260		09/10	09/20	KWM KWM
Dibromochloromethane	0.130	U	mg/Kg	EPA 8260		09/10		KWM
12Dibromo3Chloropropane	0.130		mg/Kg	EPA 8260		09/10	09/20	KWM
1,4-Dipromoethane	0.130		mg/Kg	EPA 8260		09/10	09/28	KWM
Dibromomethane	0.130		mg∕K g	EPA 8260		09/10	09/28	KWM
1,2-Dichlorobenzene	0.130		mg/Kg	EPA 8260		09/10	09/28	KWM
1,3-Dichlorobenzene	0.130		mg/Kg	EPA 8260		09/10	09/28	KWM
1,4-Dichlorobenzene	0.130		m g/K g	EPA 8260		09/10		KWM
Dichlorodifluoromethane	0.130		mg/Kg	EPA 8260		09/10		KWM
1,1-Dichloroethane	0.130		mg/Kg	EPA 8260		09/10	19/28	KWM
1,2-Dichloroethane	0.130		mg/Kg	EPA 8260		09/10	19/20	KWH
1.1-Dichloroethene	0.130		mg/Kg	EPA 8260		09/10		KWM
cis-1,2-Dichloroethene	0.130		mg/Kg	EPA 8260		09/10 (
transi,2-Dichloroethene	0.130		mg/Kg	EPA 8260		09/10 (19/28	KWM
1,2-Dichloropropane			mg/Kg	EPA 8260		09/10 0		KWM KWM
1,3-Dichloropropane			mg/Kg	EPA 8260		09/10 0		
2,2-Dichloropropane			mg/Kg	EPA 8260		09/10 0		KWM
	0.130	U I	ng/Kg	EPA 8260		09/10 0		KWM
					'	J J / I U	7/40	KWM



ENVIRONMENTAL LABORATORY SERVICES

REPORT OF ANALYSIS

Chemlab Ref.# :93.4692-12 Client Sample ID :LAY-LF01-2SD13

5633 B STREET ANCHORAGE, AK 99518

See Special Instructions Above

See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable NA = Not Analyzed

LT = Less Than

GT = Greater Than





ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

5633 B STREET ANCHORAGE, AK 99518

TEL: (907) 562-2343 FAX: (907) 561-5301

Matrix

Client Sample ID :LAY-LF01-2SD13 SPIKE

:SOIL

:ICF KAISER ENGINEERING

Client Name Ordered By Project Name

Chemlab Ref.#

:SHERI K ACE :DEW LINE RI/FS :41096-412-01

:93.4692-13

Project# PWSID

:UA

WORK Order

:70792

Report Completed :10/01/93 Collected

:09/07/93

@ 17:45 hrs @ 12:00 hrs

Received

:09/09/93 Technical Director: STEPHEN , C. EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA. FOR SPIKE CONCENTRATION AND

PERCENT RECOVERY, SEE QA/QC PACKAGE. EPH ANALYSIS HAS MATRIX

INTERFERENCE.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	37.6		~ %	EM17 2540G				
Hydrocarbons VPH	75.8		mg/Kg			20 44 2	09/10	EAL
Hydrocarbons EPH	610		mg/Kg				09/15	WLS
			mg/ ng	2310/3330/810011		09/14	09/20	JBH
Volatile Organics	5			EPA 8260				
Benzene	1.40		mg/Kg	EPA 8260		00/10	09/28	100
Bromobenzene	0 130	Ü	mg/Kg	EPA 8260			09/28	KWM
Bromochloromethar	ne 0.130	Ü	mg/Kg	EPA 8260				KWM
Bromodichlorometh	nane 0.130	Ü	mg/Kg	EPA 8260			09/28	KWM
Bromoform	0.130	Ü	mg/Kg	EPA 8260			09/28	KWM
Bromomethane	0.130	Ü	mg/Kg	EPA 8260			09/28	KWM
n-Butylbenzene	0.130	Ü	mg/Kg	EPA 8260		09/10	09/28	KWM
sec-Butylbenzene	0.130	Ü	mg/Kg	EPA 8260		09/10	09/28	KWM
tert-Butylbenzne	0.130	U	mg/Kg	EPA 8260			09/28	KWM
Carbon Tetrachlor	ride 0.130	Ü	mg/Kg	EPA 8260			09/28	KWM
Chlorobenzene	1.38	U	mg/Kg	EPA 8260		09/10		KWM
Chloroethane	0.130	U	mg/Kg	EPA 8260			09/28	KWM
Chloroform	0.130	Ü	mg/Kg	EPA 8260		09/10		KWM
Chloromethane	0.130	Ü	mg/Kg	EPA 8260		09/10		KWM
2-Chlorotoluene	0.130	Ü	mg/Kg	EPA 8260		09/10		KWM
4-Chlorotoluene	0.130	Ü	mg/Kg	EPA 8260		09/10		KWM
Dibromochlorometh	ane 0 130	Ü	mg/Kg	EPA 8260		09/10		KWM
12Dibromo3Chlorop	ropane 0.130	Ü	mg/Kg	EPA 8260		09/10	09/28	KWM
1,2-Dibromoethane	0.130	Ü	mg/Kg	EPA 8260		09/10	09/28	KWM
Dibromomethane	0 130	Ü	mg/Kg	EPA 8260		09/10		KWM
1,2-Dichlorobenze	ne 0.130	Ü	mg/Kg	EPA 8260		09/10		KWM
1,3-Dichlorobenze	ne 0.130	Ü	mg/Kg			09/10		KWM
1,4-Dichlorobenze	ne 0 130	Ü	mg/Kg	EPA 8260		09/10		KWM
Dichlorodifluorom	ethane 0.130	Ü		EPA 8260		09/10		KWM
1,1-Dichloroethan	e 0.130	Ü	mg/Kg	EPA 8260		09/10		KWM
1,2-Dichloroethan	e 0.130	IJ	mg/Kg	EPA 8260		09/10		KWM
1,1-Dichloroethen	e 0.269	U	mg/Kg	EPA 8260		09/10		KWH
cis-1,2-Dichloroe	thene 0.130	U	mg/Kg	EPA 8260		09/10		KWM
trans1,2-Dichloro	ethene 0.130	U	mg/Kg	EPA 8260		09/10		KWM
1,2-Dichloropropa	ne 0.130	U	mg/Kg	EPA 8260		09/10		KWM
1,3-Dichloropropa	ne 0.130	U	mg/Kg	EPA 8260		09/10		KWM
	0.130	U	mg/Kg	EPA 8260		09/10	09/28	KWM



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4692-13 5633 B STREET ANCHORAGE, AK 99518

Client Sample ID :LAY-LF01-2 Matrix :SOIL		TEL: (907) 562-2343 FAX: (907) 561-5301				
2,2-Dichloropropane	0.130	U	mg/Kg	EPA 8260	09/10 09/28 KW	
1,1-Dichloropropene	0.130	U	mg/Kg	EPA 8260	09/10 09/28 KWN	
Ethylbenzene	0.130	Ü	mg/Kg	EPA 8260	09/10 09/28 KWF	
Hexachlorobutadiene	0.130	U	mg/Kg	EPA 8260	09/10 09/28 KWM	
Isopropylbenzene	0.130	Ü	mg/Kg	EPA 8260	09/10 09/28 KWM	
p-Isopropyltoluene	0.130	U	mg/Kg	EPA 8260	09/10 09/28 KWM	
Methylene Chloride	0.130	U	mg/Kg	EPA 8260	09/10 09/28 KWM	
Napthalene	0.130	U	mg/Kg	EPA 8260	09/10 09/28 KWM	
n-Propylbenzene	0.130	U	mg/Kg	EPA 8260	09/10 09/28 KWM	
Styrene	0.130	Ü	mg/Kg	EPA 8260	09/10 09/28 KWM	
1112-Tetrachloroethane	0.130	U	mg/Kg	EPA 8260	09/10 09/28 KWM	
1122-Tetrachloroethane	0.130	U	mg/Kg	EPA 8260	09/10 09/28 KWM	
Tetrachloroethene	0.130	U	mg/Kg	EPA 8260	09/10 09/28 KWM	
Toluene	1.51		mg/Kg	EPA 8260	09/10 09/28 KWM	
1,2,3-Trichlorobenzene	0.130	U	mg/Kg	EPA 8260	09/10 09/28 KWM	
1,2,4-Trichlorobenzene	0.130	U	mg/Kg	EPA 8260	09/10 09/28 KWM	
1,1,1-Trichloroethane	0.130	Ü	mg/Kg	EPA 8260	09/10 09/28 KWM	
1,1,2-Trichloroethane	0.130	U	mg/Kg	EPA 8260	09/10 09/28 KWM	
Trichloroethene	1.43		mg/Kg	EPA 8260	09/10 09/28 KWM	
Trichlorofluoromethane	0.130	U	mg/Kg	EPA 8260	09/10 09/28 KWM	
1,2,3-Trichloropropane	0.130	U	mg/Kg	EPA 8260	09/10 09/28 KWM	
1,2,4-Trimethylbenzene	0.130	U	mg/Kg	EPA 8260	09/10 09/28 <u>/</u> WM	
1,3,5-Trimethylbenzene	0.130	U	mg/Kg	EPA 8260	09/10 09/28 TM	
Vinyl Chloride	0.130	U	mg/Kg	EPA 8260	09/10 09/28 - RWM	
p+m-Xylene	0.130	U	mg/Kg	EPA 8260	09/10 09/28 KWM	
o-Xylene	0.130	U	mg/Kg	EPA 8260	09/10 09/28 KWM	

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed LT = Less Than

GT = Greater Than



See Special Instructions Above

^{**} See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4692-14 Client Sample ID :LAY-LF01-2SD13 SPIKE DUPLICATE

Matrix :SOIL

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX (907) 561-5301

Client Name Ordered By

:ICF KAISER ENGINEERING

Project Name Project#

:SHERI K ACE :DEW LINE RI/FS :41096-412-01

PWSID :UA WORK Order :70792

Report Completed :10/01/93

Collected :09/07/93 @ 17:45 hrs Received :09/09/93 @ 12:00 hrs

Technical Director: STEPHEN, C. EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA. FOR SPIKE CONCENTRATION AND PERCENT RECOVERY, SEE QA/QC PACKAGE. EPH ANALYSIS HAS MATRIX

INTERFERENCE.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids Hydrocarbons VPH Hydrocarbons EPH	37.6 71.7 500		% mg/Kg mg/Kg	SM17 2540G EPA 5030/8015M 3510/3550/8100M			09/10 09/15 09/20	EAL WLS JBH
Volatile Organics Benzene Bromobenzene Bromochloromethane Bromodichloromethane Bromoform Bromomethane n-Butylbenzene sec-Butylbenzene tert-Butylbenzene Carbon Tetrachloride Chlorobenzene Chlorotene Chlorotoluene Chlorotoluene 12-Chlorotoluene 12-Dibromoschloromethane 12Dibromoschloromethane 12Dibromomethane 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,1-Dichloroethane 1,1-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethene 1,2-Dichloroethene 1,2-Dichloroethene 1,2-Dichloroethene 1,2-Dichloroethene 1,2-Dichloroethene 1,2-Dichloroethene 1,2-Dichloroethene 1,2-Dichloropropane 1,3-Dichloropropane	1.33 0.130	ממממ ממממממממממממממ ממממממממ	mg/kg mg/kg	EPA 8260 EPA 8260		09/10 09/10 09/10 09/10 09/10 09/10 09/10 09/10 09/10 09/10	09/28 09/28	ДВН КИМИ КИМИ КИМИ КИМИ КИМИ КИМИ КИМИ КИМ



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4692-14 Client Sample ID :LAY-LF01-2SD13 SPIKE DUPLICATE

Matrix :SOIL	TEL: (907) 562-2343 FAX: (907) 561-5301				
2,2-Dichloropropane	0.130 U	mg/Kg	EPA 8260	09/10 09/28	KWM
1,1-Dichloropropene	0.130 U	mg/Kg	EPA 8260	09/10 09/28	KWM
Ethylbenzene	0.130 U	mg/Kg	EPA 8260	09/10 09/28	KWM
Hexachlorobutadiene	0.130 U		EPA 8260	09/10 09/28	KWM
Isopropylbenzene	0.130 U		EPA 8260	09/10 09/28	KWM
p-Isopropyltoluene	0.130 U		EPA 8260	09/10 09/28	KWM
Methylene Chloride	0.130 U		EPA 8260	09/10 09/28	KWH
Napthalene	0.130 ប		EPA 8260	09/10 09/28	KWM
n-Propylbenzene	0.130 U		EPA 8260	09/10 09/28	KWM
Styrene	0.130 U		EPA 8260	09/10 09/28	KWM
1112-Tetrachloroethane	0.130 U	_	EPA 8260	09/10 09/28	KWM
1122-Tetrachloroethane	0.130 U	5/ ••5	EPA 8260	09/10 09/28	KWM
Tetrachloroethene	0.130 U	3/ ••3	EPA 8260	09/10 09/28	KWM
Toluene	1.42	mg/Kg	EPA 8260	09/10 09/28	
1,2,3-Trichlorobenzene	0.130 U		EPA 8260		KWM
1,2,4-Trichlorobenzene	0.130 U	27	EPA 8260	09/10 09/28	KWM
1,1,1-Trichloroethane	0.130 U	mg/Kg		09/10 09/28	KWM
1,1,2-Trichloroethane	0.130 U	mg/Kg	EPA 8260	09/10 09/28	KWM
Trichloroethene	1.30	mg/Kg	EPA 8260	09/10 09/28	KWM
Trichlorofluoromethane		mg/Kg	EPA 8260	09/10 09/28	KHH
1,2,3-Trichloropropane		5, 415	EPA 8260	09/10 09/28	KWM
1,2,4-Trimethylbenzene	0.130 U	mg/Kg	EPA 8260	09/10 09/28	KWM
1,3,5-Trimethylbenzene	0.130 U	mg/Kg	EPA 8260	09/10 09/28	
Vinyl Chloride	0.130 U	mg/Kg	EPA 8260	09/10 09/28	
p+m-Xylene	0.130 U	mg/Kg	EPA 8260	09/10 09/28	kwri
o-Xylene	0.130 U	mg/Kg	EPA 8260	09/10 09/28	KWM
o ayrene	0.130 ប	mg/Kg	EPA 8260	09/10 09/28	KWM

See Special Instructions Above

** See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable NA = Not Analyzed

5633 B STREET

ANCHORAGE, AK 99518

LT = Less Than

GT = Greater Than





ENVIRONMENTAL LABORATORY SERVICES

REPORT OF ANALYSIS

Chemlab Ref. #

:93.4692-15 Client Sample ID :LAY-LF01-2SD14

Matrix

:SOIL

5633 B STREET ANCHORAGE, AK 99518

TEL: (907) 562-2343 FAX (907) 561-5301

Client Name

: ICF KAISER ENGINEERING

Ordered By Project Name

:SHERI K ACE :DEW LINE RI/FS

Project# PWSID

:41096-412-01

:UA

WORK Order

Collected

:70792 :10/01/93

Report Completed

:09/07/93 9 18:00 hrs :09/09/93 @ 12:00 hrs

Received Technical Director: STEPHEN C. EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA.

WITH MIDDLE DISTILLATE FUEL.

EPH PATTERN IS NOT CONSISTENT

Parameter	Results	QC Qua	l Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids Hydrocarbons VPH	22.0		%	SM17 2540G				
Hydrocarbons EPH	11.9 39.9		mg/Kg mg/Kg	EPA 5030/8015M 3510/3550/8100M		09/10	09/10	EAL WLS
Volatile Organics						09/14	09/17	J BH
Benzene	0.240	,,	4	EPA 8260				
Bromobenzene	0.240	U U	mg/Kg	EPA 8260		09/10	09/28	KWH
Bromochloromethane	0.240	Ü	mg/Kg	EPA 8260			09/28	KWM
Bromodichloromethane	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromoform	0.240	Ü	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromomethane	0.240	Ü	mg/Kg mg/Kg	EPA 8260		09/10	09/28	KWM
n-Butylbenzene	0.240	ប		EPA 8260		09/10	09/28	KWM
sec-Butylbenzene	0.240	Ü	mg/Kg mg/Kg	EPA 8260			09/28	KWM
tert-Butylbenzne	0.240	Ü	mg/Kg	EPA 8260			09/28	KWM
Carbon Tetrachloride	0.240	Ü	mg/Kg	EPA 8260		09/10	09/28	KWM
Chlorobenzene	0.240	Ü	mg/Kg	EPA 8260 EPA 8260		09/10	09/28	KWM
Chloroethane	0.240	Ü	mg/Kg	EPA 8260		09/10	09/28	KWM
Chloroform	0.240	Ū	mg/Kg	EPA 8260			09/28	KWM
Chloromethane	0.240	Ū	mg/Kg	EPA 8260			09/28	KWM
2-Chlorotoluene	0.240	Ū	mg/Kg	EPA 8260		09/10		KWM
4-Chlorotoluene	0.240	Ū	mg/Kg	EPA 8260		09/10	09/28	KWM
Dibromochloromethane	0.240	Ü	mg/Kg	EPA 8260		09/10	09/28	KWM
12Dibromo3Chloropropane 1,2-Dibromoethane	0.240	ប	mg/Kg	EPA 8260		09/10	09/28	KWM
Dibromomethane	0.240	U	mg/Kg	EPA 8260		09/10		KWM
1,2-Dichlorobenzene	0.240	U	mg/Kg	EPA 8260		09/10		KWM
1,3-Dichlorobenzene	0.240	Ü	mg/Kg	EPA 8260		09/10 09/10	09/28	KWM
1,4-Dichlorobenzene	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM
Dichlorodifluoromethane	0.240	Ü	mg/Kg	EPA 8260		09/10		KWM
1,1-Dichloroethane	0.240	U	mg/Kg	EPA 8260		09/10		KWM
1,2-Dichloroethane	0.240	U	mg/Kg	EPA 8260		09/10		KWM
1,1-Dichloroethene	0.240	Ü	mg/Kg	EPA 8260		09/10	09/20	KWM
cis-1,2-Dichloroethene	0.240	Ü	mg/Kg	EPA 8260		09/10	09/20	KWM KWM
trans1,2-Dichloroethene	0.240	Ü	mg/Kg	EPA 8260		09/10		KWM KWM
1,2-Dichloropropane	0.240		mg/Kg	EPA 8260		09/10		KWM
1,3-Dichloropropane		Ü	mg/Kg	EPA 8260		09/10		KWM
2,2-Dichloropropane		U	mg/Kg	EPA 8260		09/10		KWM
	0.240	U	mg/Kg	EPA 8260		09/10	09/28	KWM



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4692-15 Client Sample ID :LAY-LF01-2SD14

Matrix :SOIL

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343

_				FAX: (907) 561-5301
1,1-Dichloropropene	0.240 U	mg/Kg	EPA 8260	09/10 00/20
Ethylbenzene	0.240 U	mg/Kg	EPA 8260	09/10 09/28 KW
Hexachlorobutadiene	0.240 U	mg/Kg	EPA 8260	09/10 09/28 KWI
Isopropylbenzene	0.240 U	mg/Kg	EPA 8260	09/10 09/28 KWI
p-Isopropyltoluene	0.240 U	mg/Kg	EPA 8260	09/10 09/28 KWI
Methylene Chloride	0.240 U	mg/Kg	EPA 8260	09/10 09/28 KW
Napthalene	0.409	mg/Kg	EPA 8260	09/10 09/28 KWP
n-Propylbenzene	0.240 U	mg/Kg	EPA 8260	09/10 09/28 KWF
Styrene	0.240 U	mg/Kg		09/10 09/28 KWE
1112-Tetrachloroethane	0.240 U		EPA 8260	09/10 09/28 KWH
1122-Tetrachloroethane	0.240 U	mg/Kg	EPA 8260	09/10 09/28 KWM
Tetrachloroethene	1.92	mg/Kg	EPA 8260	09/10 09/28 KWM
Toluene	A	mg/Kg	EPA 8260	09/10 09/28 KWM
1,2,3-Trichlorobenzene		mg/Kg	EPA 8260	09/10 09/28 KWM
1,2,4-Trichlorobenzene	0.240 U	mg/Kg	EPA 8260	09/10 09/28 K WM
1,1,1-Trichloroethane	0.240 U	mg/Kg	EPA 8260	09/10 09/28 KWM
1,1,2-Trichloroethane	0.240 U	mg/Kg	EPA 8260	09/10 09/28 KWM
Trichloroethene	0.240 U	mg/Kg	EPA 8260	09/10 09/28 KWM
Trichlorofluoromethane	0.240 U	mg/Kg	EPA 8260	09/10 09/28 KWM
1,2,3-Trichloropropane	0.240 U	mg/Kg	EPA 8260	09/10 09/28 KWM
1,2,4-Trimethylbenzene	0.240 U	mg/Kg	EPA 8260	09/10 09/28 KWM
1,3,5-Trimethylbenzene	0.552	mg/Kg	EPA 8260	09/10 09/28 KWM
Vinyl Chloride	0.342	mg/Kg	EPA 8260	09/10 09/28 WM
P+m-Xylene	0.240 U	mg/Kg	EPA 8260	09/10 09/28 M
o-Xylene	0.459	mg/Kg	EPA 8260	09/10 09/28 KMM
-	0.265	mg/Kg	EPA 8260	09/10 09/28 KWM

See Special Instructions Above

** See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed LT = Less Than

GT = Greater Than



SSS Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

Mlab Ref.# Client Sample ID :LAY-LF01-SW04 POINT LAY

:93.4356-10

REPORT of ANALYSIS

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343

FAX: (907) 561-5301

Matrix

:WATER

WORK Order

:70116

Client Name Ordered By Project Name :ICF KAISER ENGINEERING :RAY MORRIS

Report Completed :10/06/93 Collected

Project#

:DEW LINE RI/FS :41096-412-01

:08/24/93 @ 15:10 hrs.

PWSID

:UA

Received Technical Director: STEPHEN C. EDE

:08/26/93 @ 12:00 hrs.

Released By :

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.018		mg/L	EPA 8260		09/02	09/02	MCM
Bromobenzene	0.0010	U	mg/L	EPA 8260			09/02	MCM
Bromochloromethane	0.0010	Ü	mg/L	EPA 8260			09/02	MCM
Bromodichloromethane	0.0010	Ū	mg/L	EPA 8260			09/02	MCM
Bromoform	0.0010	Ü	mg/L	EPA 8260			09/02	MCM
Bromomethane	0.0010	Ū	mg/L	EPA 8260		09/02		HCM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02		MCM
sec-Butylbenzene	0.0010	Ü	mg/L	EPA 8260			09/02	MCM
tert-Butylbenzne	0.0010	ប	mg/L	EPA 8260			09/02	MCM
rbon Tetrachloride	0.0010	U	mg/L	EPA 8260		09/02		MCM
lorobenzene	0.0010	ប	mg/L	EPA 8260		09/02		HCH
Chloroethane	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
Chloroform	0.0010	U	mg/L	EPA 8260		09/02		MCM
Chloromethane	0.0010	U	mg/L	EPA 8260		09/02		MCM
2-Chlorotoluene	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260			09/02	
Dibromochloromethane	0.0010	Ū	mg/L	EPA 8260		09/02		MCM
12Dibromo3Chloropropane	0.0010	Ū	mg/L	EPA 8260		09/02		MCM
1,2-Dibromoethane	0.0010	Ū	mg/L	EPA 8260		09/02		MCM
Dibromomethane	0.0010	U	mg/L	EPA 8260		09/02		MCM
1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02		MCM
1,3-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02		MCM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02		HCM
Dichlorodifluoromethane	0.033		mg/L	EPA 8260		09/02		MCM
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02		MCM
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02		MCM
1,1-Dichloroethene	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
cis-1,2-Dichloroethene	0.0065		mg/L	EPA 8260		09/02		MCM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02		MCM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02		MCM
1,3-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02		MCM
2,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02		HCM
1,1-Dichloropropene	0.0010	U	mg/L	EPA 8260		09/02		MCM
Ethylbenzene	0.0040		mg/L	EPA 8260		09/02		MCM
Hexachlorobutadiene	0.0010	U	mg/L	EPA 8260		09/02		MCM
Isopropylbenzene	0.0010	U	mg/L	EPA 8260		09/02		HCM
p-Isopropyltoluene	0.0017		mg/L	EPA 8260		09/02		MCM
			-			· - -		



Vinyl Chloride

p+m-Xylene

o-Xylene

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

0.0010

0.013

0.0087

U

REPORT of ANALYSIS 5633 B STREET Chemlab Ref.# :93.4356-10 ANCHORAGE, A Client Sample ID :LAY-LF01-SW04 POINT LAY TEL: (907) FAX: (907) 56 Matrix :WATER EPA 8260 (U) - G. 1 Methylene Chloride 09/02 09/02 MC 0.0046 mg/L Napthalene EPA 8260(J)-J.1 09/02 09/02 MC 0.0010 U mg/L EPA 8260 MC n-Propylbenzene 0.0010 09/02 09/02 U mg/L 09/02 09/02 MC Styrene 0.0010 EPA 8260 П mg/L 1112-Tetrachloroethane 09/02 09/02 MC 0.0010 **EPA 8260** U mg/L 1122-Tetrachloroethane 09/02 09/02 MC 0.0010 **EPA 8260** U mg/L Tetrachloroethene 09/02 09/02 MC 0.084 mg/L **EPA** 8260 Toluene 09/02 09/02 MC 0.0073 **EPA 8260** mg/L 1,2,3-Trichlorobenzene mg/L **EPA 8260** 09/02 09/02 MC 0.0010 1,2,4-Trichlorobenzene 0.0010 U EPA 8260 09/02 09/02 MC mg/L 1,1,1-Trichloroethane 0.0010 U EPA 8260 09/02 09/02 MC mg/L 09/02 09/02 MC 1,1,2-Trichloroethane Ü **EPA 8260** 0.0010 mg/L 09/02 09/02 MC Trichloroethene 0.0033 EPA 8260 mg/L Trichlorofluoromethane 0.0030 **EPA 8260** 09/02 09/02 MC mg/L 1,2,3-Trichloropropane 0.0010 09/02 09/02 MC U EPA 8260 mg/L 1,2,4-Trimethylbenzene mg/L 09/02 09/02 , MC 0.0010 EPA 8260 1,3,5-Trimethylbenzene 0.0010 EPA 8260 09/02 09/02 MC U mg/L

mg/L

mg/L

mg/L

EPA 8260

EPA 8260

EPA 8260

See Special Instructions Above

** See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed

09/02 09/02

09/02 09/02

09/02 09/02

MC

MC.

MC.

LT = Less Than

GT = Greater Th





ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.#

:93.4358-1

Client Sample ID :LAY-LF01-SW04 POINT LAY

Matrix :WATER ANCHORAGE, AK 99 TEL: (907) 562-2 FAX: (907) 561-5

Client Name Ordered By

:ICF KAISER ENGINEERING :RAY MORRIS

WORK Order Report Completed :09/20/93

:70131

Project Name Project#

:DEW LINE RI/FS :41096-412-01

Collected Received

:08/24/93 @ 15:10 :08/26/93 @ 12:00

5633 B STRE

PWSID

:UA

Technical Director: STEPHEN, C. EDE Released By :

Sample Remarks: SAMPLE COLLECTED BY: J.P.

	Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	I:
	Semivolatile Organics								·
	Phenol	0.017	U	mæ /I	EPA 8270				
	bis(2-Chloroethyl)ether	0.017	Ü	mg/L	EFA 8270		09/01	09/04	,
	2-Chlorophenol	0.017	Ü	mg/Ĺ	EPA 8270		09/01	09/04	:
	1,3-Dichloropenzene	0.017	U	mg/L	EPA 8270	•	09/01	09/04	ŀ
	1,4-Dichlorobenzene	0.017	Ü	mg/L	EPA 8270		09/01	09/04	1
	Benzyl Alcohol	0.017	Ü	mg/L mg/L	EPA 8270		09/01	09/04	ŀ
	1,2-Dichloropenzene	0.017	Ü	_	EPA 8270		09/01	09/04	t
	2-Methylphenol	0.017	Ü	mg/L	EPA 8270		09/01	09/04	۲
	bis(2-Chloroisopropy))e	0.017	U	mg/L	EPA 8270		09/01	09/04	۲
F	4-Methylphenol	0.017	U	mg/L	EPA 8270		09/01	09/04	Ľ
	n-Nitroso-di-n-Propylam	0.017	Ü	mg/L	EPA 8270		09/01	09/04	۲.
	Hexachloroethane	0.017	Ü	mg/L	EPA 8270		09/01	09/04	M
	Nitrobenzene	0.017	Ü	mg/L	EPA 8270		09/01	09/04	М
	Isophorone	0.017	Ü	mg/L	EPA 8270		09/01	09/04	M
	2-Nitrophenol	0.017	Ü	mg/L	EPA 8270		09/01	09/04	M
	2,4-Dimethylphenol	0.017	Ü	mg/L	EPA 8270		09/01		М
	Benzoic Acid	0.017	Ü	mg/L	EPA 8270		09/01		М
	bis(2-Chloroethoxy)Meth	0.017	Ü	mg/L	EPA 8270		09/01	09/04	M
	2,4-Dichlorophenol	0.017	U	mg/L	EPA 8270		09/01		M
	1,2,4-Trichlorobenzene	0.017	Ü	mg/L	EPA 8270		09/01		M
	Naphthalene	0.017	U	mg/L	EPA 8270		09/01		M'
	4-Chloroaniline	0.017	Ü	mg/L	EPA 8270		09/01	09/04	Μľ
	Hexachlorobutadiene	0.017	Ü	mg/L	EPA 8270		09/01	09/04	Μʻ
	4-Chloro-3-Methylphenol	0.017	Ü	mg/L mg/L	EPA 8270		09/01		M"
	2-Methylnaphthalene	0.017	บ	mg/L	EPA 8270		09/01		M".
	Hexachlorocyclopentadie	0.017	Ü	mg/L	EPA 8270		09/01		MC
	2,4,6-Trichlorophenol	0.017	Ü	mg/L	EPA 8270		09/01	09/04	MO
	2,4,5-Trichlorophenol	0.017	Ü	mg/L	EPA 8270		09/01	09/04	MT
	2-Chloronaphthalene	0.017	Ü	mg/L	EPA 8270		09/01	09/04	MD
	2-Nitroaniline	0.017	Ü	mg/L	EPA 8270		09/01		ΓM
	Dimethylphthalate	0.017	Ü	mg/L	EPA 8270 EPA 8270		09/01		ΜŢ
	Acenaphthylene	0.017	Ü	mg/L			09/01	09/04	ΓM
	2,6-Dinitrotoluene	0.017	Ü	mg/L	EPA 8270 EPA 8270		09/01	09/04	MT
	3-Nitroaniline	0.017	U	mg/L	EPA 8270 EPA 8270		09/01		TM
	Acenaphthene	0.017	Ü	mg/L	EPA 8270 EPA 8270		09/01		MT
	2,4-Dinitrophenol	0.017	Ü	mg/L			09/01		MT
	4-Nitrophenol	0.017	ij	mg/L	EPA 8270 EPA 8270		09/01		MT
ŀ			•	g/ L	EFA 0210		09/01	09/04	MT



ENVIRONMENTAL LABORATORY SERVICES



	REP	ORT of AN	ALYSTS		
Chemlab Ref.# :93.4358-1		01.1 01 .1.			5633 B STREE
Client Sample ID :LAY-LF01-9	SW04 POINT L	ΔY			ANCHORAGE, AK 9951
Matrix :WATER	ono: Coint L	n.			TEL: (907) 562-234 FAX: (907) 561-530
Dibenzofuran	0.017 U	/5	551 4454		
2,4-Dinitrotoluene		mg/L	EPA 8270		09/01 09/04 M
Diethylphthalate	0. 01 7 U	mg/L	EPA 8270		09/01 09/04 M
4-Chlorophony) Ph	0.017 U	mg/L	EPA 8270		09/01 09/04 M
4-Chlorophenyl-Phenylet	0.017 U	mg/L	EPA 8270		09/01 09/04 M
Fluorene	0 .017 U	mg/L	EPA 8270		09/01 09/04 M
4-Nitroaniline	0. 01 7 U	mg/L	EPA 8270		09/01 09/04 M
4,6-Dinitro-2-Methylphe	0.017 U	mg/L	EPA 8270		09/01 09/04 M
n-Nitrosodiphenylamine	0. 017 U	mg/L	EPA 8270		09/01 09/04 M
4-Bromophenyl-Phenyleth	0. 01 7 ប	mg/L	EPA 8270		
Hexachlorobenzene	0.017 U	mg/L	EPA 8270		
Pentachlorophenol	0.017 U	mg/L	EPA 8270		09/01 09/04 M'
Phenanthrene	0.017 U	mg/L			09/01 09/04 M
Anthracene	0.017 U		EPA 8270		09/01 09/04 M
di-n-Butylphthalate		mg/L	EPA 8270		09/01 09/04 MC
Fluoranthene		mg/L	EPA 8270		09/01 09/04 MT
Pyrene	0.017 U	mg/L	EPA 8270		09/01 09/04 MT
	0.017 U	mg/L	EPA 8270		09/01 09/04 MC
Butylbenzylphthalate	0. 017 U	mg/L	EPA 8270		09/01 09/04 MI
3,3-Dichlorobenzidine	0.017 U	mg/L	EPA 8270		09/01 09/04 MT
Benzo(a)Anthracene	0. 017 U	mg/L	EPA 8270		09/01 09/04 MT
Chrysene	0. 01 7 U	mg/L	EPA 8270		09/01 09/04 MT
bis(2-Ethylhexyl)Phthal	0. 017 U	mg/L	EPA 8270		
di-n-Octylphthalate	0.017 U	mg/L	EPA 8270		
Benzo(b)Fluoranthene	0. 017 U	mg/L	EPA 8270		
Benzo(k)Fluoranthene	0.017 U	mg/L	EPA 8270		09/01 09/04 MT
Benzo(a)Pyrene	0.017 บ	mg/L	EPA 8270		09/01 09/04 MT
Indeno(1,2,3-cd)Pyrene	0.017 U	mg/L	EPA 8270		09/01 09/04 MT
Dibenz(a,h)Anthracene	0.017 U	mg/L			09/01 09/04 MT
Benzo(g,h,i)Perylene	0.017 U	mg/L	EPA 8270		09/01 09/04 MT
	0.017	mg/L	EPA 8270		09/01 09/04 MT
Total Metals Analysis					
ICP Screen, ICF					
Aluminum	0.18	/5	EPA	n/a	
Antimony		mg/L	EPA 6010		09/02 09/06 DL
Arsenic	0.10 U	mg/L	EPA 6010		09/02 09/06 DL
Barium	0.10 U	mg/L	EPA 6010		09/02 09/06 DL
Beryllium	0.21	mg/L	EPA 6010		09/02 09/06 DLC
Cadmium	0.050 U	mg/L	EPA 6010		09/02 09/06 DLC
Calcium	0.050 U	mg/L	EPA 6010		09/02 09/06 DLC
Chromium	81	mg/L	EPA 6010		09/02 09/06 DLC
	0.050 บ	mg/L	EPA 6010		09/02 09/06 DLC
Cobalt	0.10 U	mg/L	EPA 6010		09/02 09/06 DLC
Copper	0.050 บ	mg/L	EPA 6010		09/02 09/06 DLC
Iron	32	mg/L	EPA 6010		09/02 09/06 DLC
Lead	0.10 U	mg/L	EPA 6010		09/02 09/06 DLC
Magnesium	25	mg/L	EPA 6010		
Manganese	0.94	mg/L	EPA 6010		
Molybdenum	0.050 U	mg/L	EPA 6010		
Nickel	0.050 U	mg/L	EPA 6010		09/02 09/06 DLC
Potassium	8.0	mg/L	EPA 6010		09/02 09/06 DLG
Selenium	0.10 U	mg/L	EPA 6010		09/02 09/06 DLG
Silver	0.050 ช	mg/L	EPA 6010		09/02 09/06 DLG
Sodium	47	mg/L	EPA 6010		09/02 09/06 DLG
			- A OUIU		09/15 09/17 DFL





ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS Chemlab Ref.# :93.4358-1 Client Sample ID :LAY-LF01-SW04 POINT LAY 5633 B STREE ANCHORAGE, AK 9951 Matrix :WATER TEL: (907) 562-234 FAX: (907) 561-530 Thallium 0.005 U mq/L EPA 7841 Vanadium 09/03 09/08 0.050 E U mq/L EPA 6010 Zinc 09/02 09/06 Г 0.050 U mg/L EPA 6010 09/15 09/17 Г Dissolved Metals Analys ICP Screen, ICF EPA Aluminum n/a 0.10 Ü mg/L EPA 6010 Antimony 09/02 09/06 0.10 D U mq/L EPA 6010 Arsenic 09/02 09/06 0.10 D U mg/L Barium EPA 6010 09/02 09/06 0.32 D mq/L EPA 6010 Beryllium 09/02 09/06 0.050 D mg/L EPA 6010 Cadmium 09/02 09/06 0.050 D. U mg/L EPA 6010 Calcium 09/02 09/06 81 D. mg/L EPA 6010 Chromium 09/02 09/06 0.050 D: mg/L EPA 6010 Cobalt 09/02 09/06 D: 0.10 mg/L EPA 6010 Copper 09/02 09/06 D: 0.050 U mg/L EPA 6010 Iron 09/02 09/06 DI 22 mg/L **EPA** 6010 Lead 09/02 09/06 DI 0.10 11 mg/L EPA 6010 Magnesium 09/02 09/06 DI 25 mg/L Manganese EPA 6010 09/02 09/06 0.93 DI mq/L Molybdenum EPA 6010 09/02 09/06 0.050 Dr U mg/L EPA 6010 Nickel 09/02 09/06 0.050 DL U mg/L Potassium EPA 6010 09/02 09/06 8.2 DL mg/L Selenium EPA 6010 09/02 09/06 DL 0.10 U mg/L EPA 6010 Silver 09/02 09/06 0.050 DL U mg/L EPA 6010 Sodium 09/02 09/06 DL 49 mg/L Thallium EPA 6010 09/15 09/17 0.005 DF U mg/L EPA 7841 Vanadium 09/03 09/08 BM 0.050 Zinc mg/L EPA 6010 09/02 09/06 DL 0.060 mq/L EPA 6010 09/15 09/17 DF TOC, Nonpurgable EPA 9060 ...TOC Range n/a 17.5-18.1 mg/L EPA 9060 ...TOC Concentration 09/07 CM 17.8 mg/L EPA 9060 09/07 CM Residue, Non-Filterable 96 mq/L EPA 160.2 Residue,Filterable(TDS)

See Sample Remarks Above

= Undetected, Reported value is the practical quantification limit. D = Secondary dilution.

808

UA = Unavailable NA = Not Analyzed

09/02 09/02

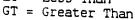
09/01 09/02

500

GP:

RJ:

LT = Less Than





mg/L

EPA 160.1



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4358-3

Client Sample ID :LAY-LF01-SW04 POINT LAY DUPLICATE

Matrix

:WATER

:RAY MORRIS

Client Name

:ICF KAISER ENGINEERING

Ordered By Project Name Project#

:DEW LINE RI/FS :41096-412-01

PWSID

:UA

WORK Order

:70131 Report Completed :09/20/93

Collected Received

:08/24/93 @ 15:10 :08/26/93 @ 12:00

ANCHORAGE, AK 99

TEL: (907) 562-2

FAX: (907) 561-5

Technical Director:STEPHEN C. EDE Released By :

Sample Remarks: SAMPLE COLLECTED BY: J.P. SEE QC PACKAGE FOR SPIKE RECOVERIES.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	-
Total Metals Analysis								
ICP Screen, ICF				EPA	n/a			
Aluminum	0.10	U	mg/L	EPA 6010		09/02	09/06	
Antimony	0.10	U	mg/L	EPA 6010			09/06	
Arsenic	0.10	U	mg/L	EPA 6010			09/06	
Barium	0.20		mg/L	EPA 6010			09/06	
Beryllium	0.050		mg/L	EPA 6010			09/06	
Cadmium	0.050	U	mg/L	EPA 6010			09/06	
Calcium	81		mg/L	EPA 6010			09/06	
Chromium	0.050		mg/L	EPA 6010		09/02	09	
Cobalt	0.10		mg/L	EPA 6010		09/02	09	
Copper	0.050	U	mg/L	EPA 6010		09/02	09/06	
Iron	32		mg/L	EPA 6010		09/02	09/06	
Lead	0.10	U	mg/L	EPA 6010		09/02	09/06	
Magnesium	25		mg/L	EPA 6010		09/02	09/06	
Manganese	0.95		mg/L	EPA 6010		09/02	09/06	
Molybdenum	0.050		mg/L	EPA 6010		09/02	09/06	
Nickel	0 .0 50	U	mg/L	EPA 6010		09/02	09/06	
Potassium	8.3		mg/L	EPA 6010		09/02	09/06	
Selenium	0.10		mg/L	EPA 6010		09/02	09/06	
Silver	0.050	U	mg/L	EPA 6010		09/02	09/06	
Sodium			mg/L	EPA 6010				
Thallium	0.005		mg/L	EPA 7841		09/03	09/08	
Vanadium	0.050	U	mg/L	EPA 6010		09/02	09/06	
Zinc			mg/L	EPA 6010				
Dissolved Metals Analys				_				
ICP Screen, ICF				EPA	n/a			
Aluminum	0.10	U	mg/L	EPA 6010		09/02	09/06	
Antimony	0.10	U	mg/L	EPA 6010	•	09/02	09/06	
Arsenic	0.10		mg/L	EPA 6010		09/02	09/06	
Barium	0.32		mg/L	EPA 6010		09/02	09/06	
Beryllium	0.050		mg/L	EPA 6010			09/06	
Cadmium	0.050	U	mg/L	EPA 6010		09/02	09/06	3
Calcium	81		mg/L	EPA 6010		09/02	09/06	3
Chromium	0.050	U	mg/L	EPA 6010		09/02		3
Cobalt	0.10		mg/L	EPA 6010		09/02		ì
Copper	0.050	U	mg/L	EPA 6010		09/02		!



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS Chemlab Ref.# :93.4358-3 5633 B STF ANCHORAGE, AK 9 Client Sample ID :LAY-LF01-SW04 POINT LAY DUPLICATE TEL: (907) 562. FAX: (907) 561-Iron 22 mg/L EPA 6010 09/02 09/06 Lead 0.10 U mg/L EPA 6010 09/02 09/06 Magnesium 25 mg/L EPA 6010 09/02 09/06 Manganese 0.94 mg/L EPA 6010 09/02 09/06 Molybdenum 0.050 mg/LEPA 6010 09/02 09/06 Nickel 0.050 mg/L EPA 6010 09/02 09/06 Potassium 8.0 mg/L EPA 6010 09/02 09/06 Selenium 0.10 U mg/L EPA 6010 09/02 09/06 Silver 0.050 U mg/L EPA 6010 09/02 09/06 Sodium mg/L EPA 6010 Thallium 0.005 U mg/L EPA 7841 09/03 09/08 Vanadium 0.050 U **EPA** 6010 mg/L 09/02 09/06 Zinc mg/L EPA 6010

** See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed

LT = Less Than

GT = Greater Than



Member of the SGS Group (Société Générale de Surveillance)

See Special Instructions Above



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4358-2

Client Sample ID :LAY-LF01-SW04 POINT LAY SPIKE

Matrix

Client Name

Project Name

Ordered By

Project*

:WATER

:ICF KAISER ENGINEERING

:RAY MORRIS :DEW LINE RI/FS **:410**96-412-01

PWSID :UA WORK Order :70131

Report Completed :09/20/93 Collected :08/24/93 @ 15:10 Received :08/26/93 @ 12:00

Technical Director: STEPHEN, C. EDE

5633 B STR

TEL: (907) 562-2 FAX: (907) 561-5

ANCHORAGE, AK 99

Released By :

Sample Remarks: SAMPLE COLLECTED BY: J.P. SEE QC PACKAGE FOR % RECOVERY AND % RSD FOR SPIKES.

 Parameter	Results	QC Qual	Units	Method	Allowable Limits			I
 Semivolatile Organics				EPA 8270	~~~~~~~~~~~~		~~~~~	
Phenol	0.023		mg/L	EPA 8270		09/01	09/04	
bis(2-Chloroethyl)ether	0.017	U	mg/L	EPA 8270		09/01		
2-Chlorophenol	0.062		mg/L	EPA 8270		09/01		
1,3-Dichlorobenzene	0.017	U	mg/L	EPA 8270		09/01		
1,4-Dichlorobenzene	0.058		mg/L	EPA 8270		09/01	09/04	
Benzyl Alcohol	0.017	U	mg/L	EPA 8270		09/01		
1,2-Dichlorobenzene	0.017	U	mg/L	EPA 8270		09/01	09/04	
2-Methylphenol	0.017	U	mg/L	EPA 8270		09/01	09	
<pre>bis(2-Chloroisopropyl)e</pre>	0.017	Ü	mg/L	EPA 8270		09/01	09	
4-Methylphenol	0.017	U	mg/L	EPA 8270		09/01		
n-Nitroso-di-n-Propylam	0.081		mg/L	EPA 8270		09/01	09/04	
Hexachloroethane	0.017	Ü	mg/L	EPA 8270		09/01		
Nitrobenzene	0.017	ប	mg/L	EPA 8270		09/01		
Isophorone	0.017	U	mg/L	EPA 8270		09/01	09/04	
2-Nitrophenol	0.017	U	mg/L	EPA 8270		09/01	09/04	
2,4-Dimethylphenol	0.017	Ü	mg/L	EPA 8270		09/01	09/04	
Benzoic Acid	0.017	U	mg/L	EPA 8270		09/01	09/04	
bis(2-Chloroethoxy)Meth	0.017	U	mg/L	EPA 8270	•	09/01	09/04	
2,4-Dichlorophenol	0.017	U	mg/L	EPA 8270		09/01		
1,2,4-Trichlorobenzene	0.065		mg/L	EPA 8270		09/01	09/04	
Naphthalene	0.017	U	mg/L	EPA 8270		09/01	09/04	
4-Chloroaniline	0.017	U	mg/L	EPA 8270		09/01	09/04	
Hexachlorobutadiene	0.017	U	mg/L	EPA 8270		09/01	09/04	
4-Chloro-3-Methylphenol	0.069		mg/L	EPA 8270		09/01	09/04	
2-Methylnaphthalene	0.017		mg/L	EPA 8270		09/01		
Hexachlorocyclopentadie		U	mg/L	EPA 8270		09/01		
2,4,6-Trichlorophenol	0.017	U	mg/L	EPA 8270		09/01		:
2,4,5-Trichlorophenol	0.017		mg/L	EPA 8270	•	09/01	09/04	;
2-Chloronaphthalene	0.017		mg/L	EPA 8270		09/01		1
2-Nitroaniline	0.017		mg/L	EPA 8270		09/01		1
Dimethylphthalate	0.017		mg/L	EPA 8270			09/04	}
Acenaphthylene	0.017		mg/L	EPA 8270		09/01		1
2,6-Dinitrotoluene	0.017	U	mg/L	EPA 8270		09/01		3
3-Nitroaniline	0.017	U	mg/L	EPA 8270		09/01		1
Acenaphthene	0.075		mg/L	EPA 8270		09/01		1
2,4-Dinitrophenol	0.017	U	mg/L	EPA 8270		09/01	09	ì



ENVIRONMENTAL LABORATORY SERVICES

Sala Strick	3 10E 908	REI	PORT of ANA	ALYSTS	
### Matrix ####################################	Chemlab Ref. # :93.4358-2		01.12 02 12.12		5633 B STE:
### A-Nitrophenol	Client Sample ID :LAY-LF01-S	W04 POINT I	AY SPIKE		ANCHORAGE, AK 99
### A-Nitrophenol 0.012	Matrix :WATER				
Dibenzofuran Color					FAA. (907) 551-5
Dibenzoruran O.017 U mg/L	4-Nitrophenol	0.012 J	mcr∕T.	FPA 8270	00/01 00/01
2.4-Dinitrotoluene 0.086					09/01 09/04
Diethylpfthalate	2,4-Dinitrotoluene				
## Chlorophenyl-Phenylet	Diethylphthalate				09/01 09/04
Fluorene 0.017 U mg/L FPA 8270 09/01 09/04 4-Mitroaniline 0.017 U mg/L FPA 8270 09/01 09/04 4-Mitroadphenylamine 0.017 U mg/L FPA 8270 09/01 09/04 4-Bromophenyl-Phenyleth 0.017 U mg/L FPA 8270 09/01 09/04 4-Bromophenyl-Phenyleth 0.017 U mg/L FPA 8270 09/01 09/04 4-Bromophenyl-Phenyleth 0.017 U mg/L FPA 8270 09/01 09/04 4-Bromophenyl-Phenyleth 0.017 U mg/L FPA 8270 09/01 09/04 Phenatchlorophenol 0.020 mg/L FPA 8270 09/01 09/04 Phenatchlorophenol 0.020 mg/L FPA 8270 09/01 09/04 Phenatchrene 0.017 U mg/L FPA 8270 09/01 09/04 Phenatchrene 0	4-Chlorophenyl-Phenylet				09/01 09/04
4-Nitroaniline					09/01 09/04
4,6-Dinitro-2-Methylphe					09/01 09/04
N-Nitrosodiphenylamine	4,6-Dinitro-2-Methylphe				09/01 09/04
### A=Bromophenyl-Phenyleth	n-Nitrosodiphenylamine				09/01 09/04
Rexachlorobenzene	4-Bromophenyl-Phenyleth				09/01 09/04
Pentachlorophenol 0.020 mg/L EPA 8270 09/01 09/04 Phenanthrene 0.017 U mg/L EPA 8270 09/01 09/04 Anthracene 0.017 U mg/L EPA 8270 09/01 09/04 di-n-Butylphthalate 0.067 mg/L EPA 8270 09/01 09/04 property of the part of the	Hexachlorobenzene				09/01 09/04
Phenanthrene Anthracene O.017 U mg/L EPA 8270 09/01 09/04 di-n-Butylphthalate O.067 mg/L EPA 8270 09/01 09/04 Pyrene O.017 U mg/L EPA 8270 09/01 09/04 Fluoranthene O.017 U mg/L EPA 8270 09/01 09/04 Fluoranthene O.017 U mg/L EPA 8270 09/01 09/04 Fluoranthene O.017 U mg/L EPA 8270 09/01 09/04 Fluoranthene O.017 U mg/L EPA 8270 09/01 09/04 Benzo(a)Anthracene O.017 U mg/L EPA 8270 09/01 09/04 Benzo(a)Anthracene O.017 U mg/L EPA 8270 09/01 09/04 Benzo(a)Anthracene O.017 U mg/L EPA 8270 09/01 09/04 Benzo(a)Anthracene O.017 U mg/L EPA 8270 09/01 09/04 Benzo(b)Fluoranthene O.017 U mg/L EPA 8270 09/01 09/04 di-n-Octylphthalate O.017 U mg/L EPA 8270 09/01 09/04 di-n-Octylphthalate O.017 U mg/L EPA 8270 09/01 09/04 di-n-Octylphthalate O.017 U mg/L EPA 8270 09/01 09/04 Benzo(b)Fluoranthene O.017 U mg/L EPA 8270 09/01 09/04 Benzo(a)Fluoranthene O.017 U mg/L EPA 8270 09/01 09/04 Benzo(a)Fyrene O.017 U mg/L EPA 8270 09/01 09/04 Benzo(a)Fyrene O.017 U mg/L EPA 8270 09/01 09/04 Benzo(a)Fyrene O.017 U mg/L EPA 8270 09/01 09/04 Fluoranthene O.017 U mg/L EPA 8270	Pentachlorophenol				09/01 09/04
Anthracene	Phenanthrene				09/01 09/04
di-n-Butylphthalate					09/01 09/04
Flucranthene	di-n-Butylphthalate	_			
Pyrene	Fluoranthene				
Butylbenzylphthalate 0.017 U mg/L EPA 8270 09/01 09/04 Benzo(a)Anthracene 0.017 U mg/L EPA 8270 09/01 09/04 Dis(2-Ethylhexyl)Phthal 0.017 U mg/L EPA 8270 09/01 09/04 Dis(2-Ethylhexyl)Phthal 0.017 U mg/L EPA 8270 09/01 09/04 Dis(2-Ethylhexyl)Phthal 0.017 U mg/L EPA 8270 09/01 09/04 Dis(2-Ethylhexyl)Phthal 0.017 U mg/L EPA 8270 09/01 09/04 Dis(2-Ethylhexyl)Phthal 0.017 U mg/L EPA 8270 09/01 09/04 Dis(2-Ethylhexyl)Phthalete 0.017 U mg/L EPA 8270 09/01 09/04 Dis(2-EPA 8270 09/01 09/04 Dis(2-EPA 8270 09/01 09/04 Dis(2-EPA 8270 09/01 09/04 Dis(2-EPA 8270 09/01 09/04 Dis(2-EPA 8270 09/01 09/04 Dis(2-EPA 8270 09/01 09/04 Dis(2-EPA 8270 09/01 09/04 Disenzo(a)Pyrene 0.017 U mg/L EPA 8270 09/01 09/04 Disenz(a,h)Anthracene 0.017 U mg/L EPA 8270 09/01 09/04 Disenz(a,h)Anthracene 0.017 U mg/L EPA 8270 09/01 09/04 Disenz(a,h)Anthracene 0.017 U mg/L EPA 8270 09/01 09/04 Disenz(a,h)Anthracene 0.017 U mg/L EPA 8270 09/01 09/04 Disenz(a,h)Anthracene 0.017 U mg/L EPA 8270 09/01 09/04 Disenz(a,h)Anthracene 0.017 U mg/L EPA 8270 09/01 09/04 Disenz(a,h)Anthracene 0.017 U mg/L EPA 8270 09/01 09/04 Disenz(a,h)Anthracene 0.017 U mg/L EPA 8270 09/01 09/04 Disenz(a,h)Anthracene 0.017 U mg/L EPA 8270 09/01 09/04 Disenz(a,h)Anthracene 0.017 U mg/L EPA 8270 09/01 09/04 Disenz(a,h)Anthracene 0.017 U mg/L EPA 8270 09/01 09/04 Disenz(a,h)Anthracene 0.017 U mg/L EPA 8270 09/01 09/04 Disenz(a,h)Anthracene 0.017 U mg/L EPA 8010 09/02 09/06 Disenz(a,h)Anthracene 0.017 U mg/L EPA 8010 09/02 09/06 Disenz(a,h)Anthracene 0.017 U mg/L EPA 8010 09/02 09/06 Disenz(a,h)Anthracene 0.017 U mg/L EPA 8010 09/02 09/06 Disenz(a,h)Anthracene 0.017 U mg/L EPA 8010 09/02 09/06 Disenz(a,h)Anthracene 0.017 U mg/L EPA 8010 09/02 09/06 Disenz(a,h)Anthracene 0.017 U mg/L EPA 8010 09/02 09/06 Disenz(a,h)Anthracene 0.017 U mg/L EPA 8010 09/02 09/06 Disenz(a,h)Anthracene 0.017 U mg/L EPA 8010 09/02 09/06 Disenz(a,h)Anthracene 0.017 U mg/L EPA 8010 09/02 09/06 Disenz(a,h)Anthracene 0.017 U mg/L EPA 8010 09/02 09/06 Disenz(a,h)Anthracene 0.017 U mg/L EPA 8010 09/02 09/06 Dis					09/01 09/04
3.3-Dichlorobenzidine	Butylbenzylphthalate				09/01 09/04
Benzo(a)Anthracene	3,3-Dichlorobenzidine				09/01 09/04
Chrysene bis(2-Ethylhexyl)Phthal 0.017 U mg/L EPA 8270 09/01 09/04 1 di-n-Octylphthalate 0.017 U mg/L EPA 8010 09/02 09/06 E PA 8270 09/01 09/04 1 di-n-Octylphthalate 0.017 U mg/L EPA 8010 09/02 09/06 E PA 8270 09/06 E PA 8270 09/01 09/02 09/06 E PA 8270	Benzo(a)Anthracene				09/01 09/04
Dis(2-Ethylhexyl)Phthal 0.017 U mg/L	Chrysene				09/01 09/04
Selenium Selection Selec	bis(2-Ethylhexyl)Phthal				
Benzo(b)Fluoranthene Benzo(k)Fluoranthene Benzo(k)Fluoranthene Benzo(k)Fluoranthene Benzo(a)Pyrene 0.017 U mg/L EPA 8270 09/01 09/04 } Benzo(a)Pyrene 0.017 U mg/L EPA 8270 09/01 09/04 } Indeno(1,2,3-cd)Pyrene 0.017 U mg/L EPA 8270 09/01 09/04 } Dibenz(a,h)Anthracene 0.017 U mg/L EPA 8270 09/01 09/04 } Dibenz(a,h)Anthracene 0.017 U mg/L EPA 8270 09/01 09/04 } Benzo(g,h,i)Perylene 0.017 U mg/L EPA 8270 09/01 09/04 } Total Metals Analysis ICP Screen, ICF Aluminum 1.12 mg/L EPA 6010 Antimony 0.89 mg/L EPA 6010 09/02 09/06 I Barium 1.21 mg/L EPA 6010 09/02 09/06 I Barium 1.21 mg/L EPA 6010 09/02 09/06 I Beryllium 0.39 mg/L EPA 6010 09/02 09/06 I Cadmium 0.46 mg/L EPA 6010 09/02 09/06 I Calcium 09 00 mg/L EPA 6010 09/02 09/06 I Calcium 09 00 mg/L EPA 6010 09/02 09/06 I Calcium 0.95 mg/L EPA 6010 09/02 09/06 I Cobalt 0.92 mg/L EPA 6010 09/02 09/06 I Copper 1.01 mg/L EPA 6010 09/0	di-n-Octylphthalate				
Benzo(k)Fluoranthene Benzo(a)Pyrene Benzo(a)Pyrene Benzo(a)Pyrene Benzo(a)Pyrene Benzo(a,h)Anthracene Benzo(a,h)Anthracene Benzo(a,h)Anthracene Benzo(a,h)Anthracene Benzo(a,h)Anthracene Benzo(a,h)Anthracene Benzo(a,h)Anthracene Benzo(a,h)Anthracene Benzo(a,h)Anthracene Benzo(a,h)Berylene ICF Screen, ICF ICF Screen, ICF Aluminum 1.12 Mg/L EPA 8270 Berylium 1.21 Mg/L EPA 6010 Berylium 1.21 Berylium 1.22 Berylium 1.24 Berylium 1.25 Berylium 1.25 Berylium 1.26 Berylium 1.27 Berylium 1.28 Berylium 1.29 Berylium 1.20 Berylium 1.20 Berylium 1.21 Berylium 1.21 Berylium 1.22 Berylium 1.22 Berylium 1.22 Berylium 1.23 Berylium 1.24 Berylium 1.25 Berylium 1.25 Berylium 1.25 Berylium 1.25 Berylium 1.26 Berylium 1.27 Berylium 1.27 Berylium 1.28 Berylium 1.29 Berylium 1.20 Berylium 1.20 Berylium 1.21 Berylium	Benzo(b)Fluoranthene				
Benzo(a)Pyrene	Benzo(k)Fluoranthene				
Indeno(1,2,3-cd)Pyrene	Benzo(a)Pyrene	0.017 Ū			
Dibenz(a,h)Anthracene 0.017 U mg/L	Indeno(1,2,3-cd)Pyrene	0.017 U			
Total Metals Analysis	Dibenz(a,h)Anthracene				
Total Metals Analysis	Benzo(g,h,i)Perylene	0.017 U			
ICP Screen, ICF Aluminum 1.12 mg/L EPA 6010 09/02 09/06 E Antimony 0.89 mg/L EPA 6010 09/02 09/06 E Barium 1.21 mg/L EPA 6010 09/02 09/06 E Beryllium 0.39 mg/L EPA 6010 09/02 09/06 E Cadmium 0.46 mg/L EPA 6010 09/02 09/06 E Calcium 90 mg/L EPA 6010 09/02 09/06 E Chromium 0.95 mg/L EPA 6010 09/02 09/06 E Chromium 0.95 mg/L EPA 6010 09/02 09/06 E Cobalt 0.92 mg/L EPA 6010 09/02 09/06 E Copper 1.01 mg/L EPA 6010 09/02 09/06 E Iron 33 mg/L EPA 6010 09/02 09/06 E Iron 33 mg/L EPA 6010 09/02 09/06 E Lead 0.88 mg/L EPA 6010 09/02 09/06 E Magnesium 35 mg/L EPA 6010 09/02 09/06 E Magnesium 35 mg/L EPA 6010 09/02 09/06 E Magnesium 35 mg/L EPA 6010 09/02 09/06 E Magnesium 35 mg/L EPA 6010 09/02 09/06 E Manganese 1.92 mg/L EPA 6010 09/02 09/06 E Molybdenum 0.93 mg/L EPA 6010 09/02 09/06 E Molybdenum 0.93 mg/L EPA 6010 09/02 09/06 E Nickel 0.92 mg/L EPA 6010 09/02 09/06 E Potassium 18.1 mg/L EPA 6010 09/02 09/06 E Selenium 0.91 mg/L EPA 6010 09/02 09/06 E Selenium 0.91 mg/L EPA 6010 09/02 09/06 E Selenium 0.91 mg/L EPA 6010 09/02 09/06 E Selenium 0.91 mg/L EPA 6010 09/02 09/06 E Silver 0.088	- • • • • •		3. ==	02,0	03/01 03/04 F
Aluminum Antimony Antimony O.89 mg/L EPA 6010 O9/02 09/06 E Arsenic O.91 mg/L EPA 6010 Barium 1.21 mg/L EPA 6010 O9/02 09/06 E Beryllium O.39 mg/L EPA 6010 Cadmium O.46 mg/L EPA 6010 Calcium O9/02 09/06 E Chromium O.95 mg/L EPA 6010 Cobalt O.92 mg/L EPA 6010 O9/02 09/06 E Copper 1.01 mg/L EPA 6010 O9/02 09/06 E Copper 1.01 mg/L EPA 6010 O9/02 09/06 E Iron 33 mg/L EPA 6010 O9/02 09/06 E Iron 33 mg/L EPA 6010 O9/02 09/06 E Iron 33 mg/L EPA 6010 O9/02 09/06 E Amagnesium Magnesium 35 mg/L EPA 6010 O9/02 09/06 E Magnesium 35 mg/L EPA 6010 O9/02 09/06 E Magnesium 35 mg/L EPA 6010 O9/02 09/06 E Magnesium O.88 mg/L EPA 6010 O9/02 09/06 E Magnesium O.93 mg/L EPA 6010 O9/02 09/06 D Mickel O.92 mg/L EPA 6010 O9/02 09/06 D Nickel O.92 mg/L EPA 6010 O9/02 09/06 D Nickel O.92 mg/L EPA 6010 O9/02 09/06 D Nickel O.92 mg/L EPA 6010 O9/02 09/06 D Nickel O.92 mg/L EPA 6010 O9/02 09/06 D Selenium O.91 mg/L EPA 6010 O9/02 09/06 D Selenium O.91 mg/L EPA 6010 O9/02 09/06 D Selenium O.91 mg/L EPA 6010 O9/02 09/06 D Selenium O.91 mg/L EPA 6010 O9/02 09/06 D Selenium O.91 mg/L EPA 6010 O9/02 09/06 D Selenium O.91 mg/L EPA 6010 O9/02 09/06 D Selenium O.91 mg/L EPA 6010 O9/02 09/06 D Selenium O.91 mg/L EPA 6010 O9/02 09/06 D Selenium O.91 mg/L EPA 6010 O9/02 09/06 D Selenium O.91 mg/L EPA 6010 O9/02 09/06 D Selenium O.91 mg/L EPA 6010 O9/02 09/06 D Selenium O.91 mg/L EPA 6010 O9/02 09/06 D Selenium O.91 mg/L EPA 6010 O9/02 09/06 D Selenium O.91 mg/L EPA 6010 O9/02 09/06 D Selenium O.91 mg/L EPA 6010 O9/02 09/06 D Selenium O.91 mg/L EPA 6010 O9/02 09/06 D Selenium O.91 mg/L EPA 6010 O9/02 09/06 D Selenium O.91 mg/L EPA 6010	Total Metals Analysis			_	•
Antimony 0.89 mg/L EPA 6010 09/02 09/06 I Barium 1.21 mg/L EPA 6010 09/02 09/06 I Barium 1.21 mg/L EPA 6010 09/02 09/06 I Barium 1.21 mg/L EPA 6010 09/02 09/06 I Beryllium 0.39 mg/L EPA 6010 09/02 09/06 I Beryllium 0.46 mg/L EPA 6010 09/02 09/06 I Cadmium 0.46 mg/L EPA 6010 09/02 09/06 I Calcium 90 mg/L EPA 6010 09/02 09/06 I Chromium 0.95 mg/L EPA 6010 09/02 09/06 I Chromium 0.95 mg/L EPA 6010 09/02 09/06 I Copper 1.01 mg/L EPA 6010 09/02 09/06 I I I mg/L EPA 6010 09/02 09/06 I I mg/L EPA 6010 09/02 09/06 I I mg/L EPA 6010 09/02 09/06 I I mg/L EPA 6010 09/02 09/06 I I mg/L EPA 6010 09/02 09/06 I I mg/L EPA 6010 09/02 09/06 I I mg/L EPA 6010 09/02 09/06 I I mg/L EPA 6010 09/02 09/06 I I mg/L EPA 6010 09/02 09/06 I Manganese 1.92 mg/L EPA 6010 09/02 09/06 I Manganese 1.92 mg/L EPA 6010 09/02 09/06 I Manganese 1.92 mg/L EPA 6010 09/02 09/06 I Manganese 1.92 mg/L EPA 6010 09/02 09/06 I Manganese 1.92 mg/L EPA 6010 09/02 09/06 I Manganese 1.92 mg/L EPA 6010 09/02 09/06 I Manganese 1.92 mg/L EPA 6010 09/02 09/06 I Manganese 1.92 mg/L EPA 6010 09/02 09/06 I Manganese 1.92 mg/L EPA 6010 09/02 09/06 I Manganese 1.92 mg/L EPA 6010 09/02 09/06 I Selenium 0.93 mg/L EPA 6010 09/02 09/06 I Selenium 0.91 mg/L EPA 6010 09/02 09/06 I Selenium 0	ICP Screen, ICF			EPA	n/a
Artimony Arsenic O.91 mg/L EPA 6010 O9/02 09/06 E Barium 1.21 mg/L EPA 6010 O9/02 09/06 E Beryllium O.39 mg/L EPA 6010 O9/02 09/06 E Cadmium O.46 mg/L EPA 6010 Calcium O9/02 09/06 E Chromium O.95 mg/L EPA 6010 Cobalt O9/02 09/06 E Copper 1.01 mg/L EPA 6010 O9/02 09/06 E Copper 1.01 mg/L EPA 6010 O9/02 09/06 E Iron O9/02 09/06 D Iron O9/02 09/06 D Iron O9/02 09/06 D Iron O9/02 09/06 D Iron O			mg/L		
Arsenic Barium 1.21 mg/L EPA 6010 09/02 09/06 E Beryllium 0.39 mg/L EPA 6010 09/02 09/06 E Cadmium 0.46 mg/L EPA 6010 09/02 09/06 E Calcium 90 mg/L EPA 6010 09/02 09/06 E Chromium 0.95 mg/L EPA 6010 09/02 09/06 E Cobalt 0.92 mg/L EPA 6010 09/02 09/06 E Copper 1.01 mg/L EPA 6010 09/02 09/06 E Iron 33 mg/L EPA 6010 09/02 09/06 E Iron 33 mg/L EPA 6010 09/02 09/06 E Iron Lead 0.88 mg/L EPA 6010 09/02 09/06 E Magnesium 35 mg/L EPA 6010 09/02 09/06 E Magnesium 35 mg/L EPA 6010 09/02 09/06 E Manganese 1.92 mg/L EPA 6010 09/02 09/06 E Manganese 1.92 mg/L EPA 6010 09/02 09/06 E Manganese 1.92 mg/L EPA 6010 09/02 09/06 D Mickel 0.93 mg/L EPA 6010 09/02 09/06 D Nickel 0.92 mg/L EPA 6010 09/02 09/06 D Selenium 18.1 mg/L EPA 6010 09/02 09/06 D Selenium 0.91 mg/L EPA 6010 09/02 09/06 D Selenium 0.91 mg/L EPA 6010 09/02 09/06 D Selenium 0.91 mg/L EPA 6010 09/02 09/06 D Selenium 0.91 mg/L EPA 6010 09/02 09/06 D Selenium 0.91 mg/L EPA 6010 09/02 09/06 D Selenium	Antimony	0.89			
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Beryllium 0.39 mg/L EPA 6010 09/02 09/06 C Cadmium 0.46 mg/L EPA 6010 09/02 09/06 C Calcium 90 mg/L EPA 6010 09/02 09/06 C Chromium 0.95 mg/L EPA 6010 09/02 09/06 C Cobalt 0.92 mg/L EPA 6010 09/02 09/06 C Copper 1.01 mg/L EPA 6010 09/02 09/06 C Iron 33 mg/L EPA 6010 09/02 09/06 C Lead 0.88 mg/L EPA 6010 09/02 09/06 C Manganesium 35 mg/L EPA 6010 09/02 09/06 C Manganese 1.92 mg/L EPA 6010 09/02 09/06 D Molybdenum 0.93 mg/L EPA 6010 09/02 09/06 D Nickel 0.92 mg/L EPA 6010 09/02 09/06 D Selenium 0.91 mg/L EPA 6010 <td></td> <td></td> <td></td> <td></td> <td></td>					
Calcium 90 mg/L EPA 6010 09/02 09/06 E Chromium 0.95 mg/L EPA 6010 09/02 09/06 E Cobalt 0.92 mg/L EPA 6010 09/02 09/06 E Copper 1.01 mg/L EPA 6010 09/02 09/06 E Iron 33 mg/L EPA 6010 09/02 09/06 E Lead 0.88 mg/L EPA 6010 09/02 09/06 E Magnesium 35 mg/L EPA 6010 09/02 09/06 E Manganese 1.92 mg/L EPA 6010 09/02 09/06 E Molybdenum 0.93 mg/L EPA 6010 09/02 09/06 D Nickel 0.92 mg/L EPA 6010 09/02 09/06 D Nickel 0.92 mg/L EPA 6010 09/02 09/06 D Nickel 0.92 mg/L EPA 6010 09/02 09/06 D Selenium 0.91 mg/L EPA 6010 09/02 09/06 D Selenium 0.91 mg/L EPA 6010 09/02 09/06 D Silver 0.088 mg/L EPA 6010 09/02 09/06 D Silver 0.088 mg/L EPA 6010 09/02 09/06 D Silver 0.088 mg/L EPA 6010 09/02 09/06 D Silver 0.088 mg/L EPA 6010 09/02 09/06 D					
Chromium 90 mg/L EPA 6010 09/02 09/06 E Chromium 0.95 mg/L EPA 6010 09/02 09/06 E Cobalt 0.92 mg/L EPA 6010 09/02 09/06 E Copper 1.01 mg/L EPA 6010 09/02 09/06 E Iron 33 mg/L EPA 6010 09/02 09/06 E Lead 0.88 mg/L EPA 6010 09/02 09/06 E Magnesium 35 mg/L EPA 6010 09/02 09/06 E Manganese 1.92 mg/L EPA 6010 09/02 09/06 E Molybdenum 0.93 mg/L EPA 6010 09/02 09/06 E Nickel 0.92 mg/L EPA 6010 09/02 09/06 E Nickel 0.92 mg/L EPA 6010 09/02 09/06 E Selenium 0.91 mg/L EPA 6010 09/02 09/06 E Selenium 0.91 mg/L EPA 6010 09/02 09/06 E Silver 0.088 mg/L EPA 6010 09/02 09/06 E			mg/L		
Cobalt 0.92 mg/L EPA 6010 09/02 09/06 El Copper 1.01 mg/L EPA 6010 09/02 09/06 El Iron 33 mg/L EPA 6010 09/02 09/06 El Iron 33 mg/L EPA 6010 09/02 09/06 El Iron 35 mg/L EPA 6010 09/02 09/06 El Magnesium 35 mg/L EPA 6010 09/02 09/06 El Manganese 1.92 mg/L EPA 6010 09/02 09/06 El Molybdenum 0.93 mg/L EPA 6010 09/02 09/06 El Molybdenum 0.93 mg/L EPA 6010 09/02 09/06 El Nickel 0.92 mg/L EPA 6010 09/02 09/06 El Nickel 0.92 mg/L EPA 6010 09/02 09/06 El Selenium 0.91 mg/L EPA 6010 09/02 09/06 El Selenium 0.91 mg/L EPA 6010 09/02 09/06 El Selenium 0.91 mg/L EPA 6010 09/02 09/06 El Selenium 0.91 mg/L EPA 6010 09/02 09/06 El Selenium 0.91 mg/L EPA 6010 09/02 09/06 El Selenium 0.91 mg/L EPA 6010 09/02 09/06 El Selenium 0.991 mg			mg/L		
Copper 1.01 mg/L EPA 6010 09/02 09/06 Elead 0.88 mg/L EPA 6010 09/02 09/06 Elead 0.88 mg/L EPA 6010 09/02 09/06 Elead 0.88 mg/L EPA 6010 09/02 09/06 Elead 0.88 mg/L EPA 6010 09/02 09/06 Elead 0.88 mg/L EPA 6010 09/02 09/06 Elead 0.90					
1.01 mg/L EPA 6010 09/02 09/06 EPA 6010 EPA 6010 09/02 09/06 EPA 6010 09/02 09					
Lead 0.88 mg/L EPA 6010 09/02 09/06 DE Magnesium 35 mg/L EPA 6010 09/02 09/06 DE Manganese 1.92 mg/L EPA 6010 09/02 09/06 DE Molybdenum 0.93 mg/L EPA 6010 09/02 09/06 DE Nickel 0.92 mg/L EPA 6010 09/02 09/06 DE Potassium 18.1 mg/L EPA 6010 09/02 09/06 DE Selenium 0.91 mg/L EPA 6010 09/02 09/06 DE Silver 0.088 mg/L EPA 6010 09/02 09/06 DE Silver 0.088 mg/L EPA 6010 09/02 09/06 DE Silver 0.088 mg/L EPA 6010 09/02 09/06 DE SIlver 0.088 mg/L EPA 6010 09/02 09/06 DE SILVER 0.088 mg/L EPA 6010 09/02 09/06 DE SILVER 0.088 mg/L EPA 6010 09/02 09/06 DE SILVER 0.088 mg/L EPA 6010 09/02 09/06 DE SILVER 0.088 mg/L EPA 6010 09/02 09/06 DE SILVER 0.088 mg/L EPA 6010 09/02 09/06 DE SILVER 0.088			mg/L		
Magnesium 35 mg/L EPA 6010 09/02 09/06 DI Manganese 1.92 mg/L EPA 6010 09/02 09/06 DI Molybdenum 0.93 mg/L EPA 6010 09/02 09/06 DI Nickel 0.92 mg/L EPA 6010 09/02 09/06 DI Potassium 18.1 mg/L EPA 6010 09/02 09/06 DI Selenium 0.91 mg/L EPA 6010 09/02 09/06 DI Silver 0.088 mg/L EPA 6010 09/02 09/06 DI			mg/L		
Manganese 1.92 mg/L EPA 6010 09/02 09/06 DI Molybdenum 0.93 mg/L EPA 6010 09/02 09/06 DI Nickel 0.92 mg/L EPA 6010 09/02 09/06 DI Potassium 18.1 mg/L EPA 6010 09/02 09/06 DI Selenium 0.91 mg/L EPA 6010 09/02 09/06 DI Silver 0.088 mg/L EPA 6010 09/02 09/06 DI			mg/L		
1.92 mg/L EPA 6010 09/02 09/06 DE					
Nickel 0.93 mg/L EPA 6010 09/02 09/06 DI Potassium 18.1 mg/L EPA 6010 09/02 09/06 DI Selenium 0.91 mg/L EPA 6010 09/02 09/06 DI Silver 0.088 mg/L EPA 6010 09/02 09/06 DI O9/02 09/06 DI Silver 0.088 mg/L EPA 6010 09/02 09/06 DI O9/02 DI O9/02 DI O9/02 DI O9/02 DI O9/02 DI O9/02 DI O9/02 DI O9/02 DI O9/02 D					
Potassium 18.1 mg/L EPA 6010 09/02 09/06 DE Selenium 0.91 mg/L EPA 6010 09/02 09/06 DE Silver 0.088 mg/L EPA 6010					
Selenium 0.91 mg/L EPA 6010 09/02 09/06 DI Silver 0.088 mg/L EPA 6010 09/02 09/06 DI				EPA 6010	
Silver 0.088 mg/L EPA 6010 09/02 09/06 DE				EPA 6010	
U.UOO MO// PD\$ CA4A					
		0.088	mg/L	EPA 6010	





ENVIRONMENTAL LABORATORY SERVICES

5 %C E 19C8		REPOR	r of analy	SIS		
Chemlab Ref.#						5633 B ST
Client Sample ID		POINT LAY	SPIKE			ANCHORAGE, AK TEL: (907) 562
Matrix	:WATER					FAX: (907) 561
Sodium			7.	FTD 6010		
Thallium	0	.016	mg/L mg/L	EPA 6010 EPA 7841		00.400 00.400
Vanadium		0.92	ing/L	EPA 6010		09/03 09/08
Zinc			ng/L	EPA 6010		09/02 09/06
			IIIg/ L	EFA 6010		
Dissolved Metal	ls Analys			-		
ICP Screen, ICE				EPA	n/a	
Aluminum		1.06	mg/L	EPA 6010	, C	09/02 09/06
Antimony		0.90	mg/L	EPA 6010		09/02 09/06
Arsenic		0.92	mg/L	EPA 6010		09/02 09/06
Barium		1.33	mg/L	EPA 6010		09/02 09/06
Beryllium		0.39	mg/L	EPA 6010		09/02 09/06
Cadmium		0.46	mg/L	EPA 6010		09/02 09/06
Calcium		90	mg/L	EPA 6010		09/02 09/06
Chromium		0.95	mg/L	EPA 6010		09/02 09/06
Cobalt		0.92	mg/L	EPA 6010		09/02 09/06
Copper		0 .9 9	mg/L	EPA 6010		09/02 09/06
Iron		23	mg/L	EPA 6010		09/02 09/06
Lead		0.86	mg/L	EPA 6010		09/02 09/06
Magnesium		35	mg/L	EPA 6010		09/02 09/06
Manganese		1.93	mg/L	EPA 6010		09/02 09/06
Molybdenum Nickel		0.95	mg/L	EPA 6010		09/02 09/06
Potassium		0.93	mg/L	EPA 6010		09/02 09
Selenium		16.7	mg/L	EPA 6010		09/02 09/
Silver		0.89	mg/L	EPA 6010		09/02 09/06
Sodium	U	.087	mg/L	EPA 6010		09/02 09/06
Thallium	•	016	ng/L	EPA 6010		
Vanadium		.016	mg/L	EPA 7841		09/03 09/08
Zinc	ı	0.92	mg/L	EPA 6010		09/02 09/06
aarre			mg/L	EPA 6010		

D = Secondary dilution.

UA = Unavail NA = Not Anal

LT = Less Than

GT = Greater Than



See Special Instructions Above

^{**} See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.



ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.#

REPORT of ANALYSIS

5633 B STREE ANCHORAGE, AK 995 TEL: (907) 562-23

:93.4358-6

Client Sample ID :LAY-LF01-SW04 POINT LAY SPIKE DUPLICATE

Matrix

:WATER

Client Name

:ICF KAISER ENGINEERING

WORK Order

FAX: (907) 561-530

Ordered By

:RAY MORRIS

Report Completed

:70131 :09/20/93

Project Name

:DEW LINE RI/FS

Collected

:08/24/93 @ 15:10 h

Project# PWSID

:41096-412-01

Received

:08/26/93 @ 12:00 h

:UA

Technical Director: STEPHEN, C. EDE Released By :

Sample Remarks: SAMPLE COLLECTED BY: J.P. SEE QC PACKAGE FOR SPIKE RECOVERIES.

 Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	In
Semivolatile Organics				EPA 8270				
Phenol	0.067		mg/L	EPA 8270				
bis(2-Chloroethyl)ether	0.019	U	mg/L	EPA 8270		09/01	09/04	M
2-Chlorophenol	0.124	J	mg/L	EPA 8270		09/01	09/04	M.
1,3-Dichlorobenzene	0.019	U	mg/L	EPA 8270		09/01	09/04	H'
1,4-Dichlorobenzene	0.084	J	mg/L	EPA 8270			09/04	M
Benzyl Alcohol	0.019	U	mg/L	EPA 8270		09/01	09/04	Μſ
1,2-Dichlorobenzene	0.019	บั	mg/L	EPA 8270			09/04	MT.
2-Methylphenol	0.019	Ü	mg/L	EPA 8270		09/01	09/04	MC
bis(2-Chloroisopropyl)e	0.019	Ŭ	mg/L	EPA 8270		09/01	09/04	MI
4-Methylphenol	0.019	บ	mg/L	EPA 8270		09/01	09/04	MI
n-Nitroso-di-n-Propylam	0.126	J	mg/L	EPA 8270		09/01	09/04	MT.
Hexachloroethane	0.019	U	mg/L	EPA 8270		09/01	09/04	MI
Nitrobenzene	0.019	Ü	mg/L	EPA 8270		09/01	09/04	MI
Isophorone	0.019	Ü	mg/L	EPA 8270			09/04	TM.
2-Nitrophenol	0.019	Ü	mg/L	EPA 8270			09/04	MΤ
2,4-Dimethylphenol	0.019	Ü	mg/L				09/04	IM
Benzoic Acid	0.019	Ü	mg/L	EPA 8270			09/04	MI
bis(2-Chloroethoxy)Meth	0.019	Ü	mg/L	EPA 8270 EPA 8270			09/04	MI
2,4-Dichlorophenol	0.019	U	mg/L	EPA 8270			09/04	MT
1,2,4-Trichlorobenzene	0.098	J	mg/L	EPA 8270		09/01	09/04	MT
Naphthalene	0.019	U	mg/L	EPA 8270		09/01		MT
4-Chloroaniline	0.019	Ü	mg/L	EPA 8270		09/01		MT
Hexachlorobutadiene	0.019	-	mg/L	EPA 8270		09/01		MT
4-Chloro-3-Methylphenol	0.139	Ū	mg/L	EPA 8270		09/01		MT
2-Methylnaphthalene	0.019	U	mg/L	EPA 8270		09/01	09/04	MT
Hexachlorocyclopentadie	0.019	Ü	mg/L	EPA 8270		09/01	09/04	MT
2,4,6-Trichlorophenol	0.019	Ü	mg/L	EPA 8270		09/01		MT
2,4,5-Trichlorophenol	0.019	Ü	mg/L	EPA 8270		09/01		MT
2-Chloronaphthalene	0.019	Ü	mg/L	EPA 8270		09/01	09/04	MT
2-Nitroaniline	0.019	Ü	mg/L	EPA 8270		09/01		MT
Dimethylphthalate	0.019	Ü	mg/L	EPA 8270		09/01		MT
Acenaphthylene	0.019	Ü	mg/L	EPA 8270		09/01		MT
2,6-Dinitrotoluene	0.019	Ü	mg/L	EPA 8270		09/01		MT
3-Nitroaniline	0.019	Ü	mg/L			09/01		MT
Acenaphthene	0.122	J	mg/L	EPA 8270 EPA 8270		09/01		MT
2,4-Dinitrophenol	0.019	U	mg/L	EPA 8270		09/01		MT
4-Nitrophenol	0.039	J	mg/L			09/01	09/04	MT
<u>-</u>			g/ L	EPA 8270		09/01	09/04	MT.



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4358-6 Client Sample ID :LAY-LF01-SW04 POINT LAY SPIKE DUPLICATE Matrix :WATER

ANCHORAGE, AK 995 TEL: (907) 562-20 FAX: (907) 561-53

natrix	WATER						FAX: (9)	07) 561-	50
Dibenzofur	an	0.019	U	mq/L	EPA 827	0 09/	01 09/	′0 <i>4</i>	
2,4-Dinitr	otoluene	0.138		mg/L	EPA 827		01 09/		
Diethylpht	halate	0.019	U	mg/L	EPA 827	- •	01 09/		
4-Chloroph	enyl-Phenylet	0.019	Ü	mg/L	EPA 827	•	01 09/		
Fluorene		0.019	U	mg/L	EPA 827	•	01 09/		
4-Nitroani	line	0.019	Ü	mg/L	EPA 827		01 09/	′0.4	
4,6-Dinitr	o-2-Methylphe	0.019	U	mg/L	EPA 827		01 09/		•
n-Nitrosod	iphenylamine	0.019	U	mg/L	EPA 827	•	01 09/		÷
	nyl-Phenyleth	0.019	U	mg/L	EPA 827	- ·	01 09/		,
Hexachloro	benzene	0.019	U	mg/L	EPA 827	·	01 09/		,
Pentachlor	ophenol	0.021		mg/L	EPA 827	•	01 09/		:
Phenanthre	ne	0.019	U	mg/L	EPA 827	·	01 09/		٠,
Anthracene		0.019	U	mg/L	EPA 827	- •	01 09/		1
di-n-Butyl	phthalate	0.098		mg/L	EPA 827	•	01 09/		,
Fluoranthe	ne	0.019	U	mg/L	EPA 827		01 09/		ŧ
Pyrene		0.140		mg/L	EPA 827		01 09/		1
Butylbenzy	lphthalate	0.019	U	mg/L	EPA 827		01 09/		,
3,3-Dichlo	robenzidine	0.019	U	mg/L	EPA 827	•	01 09/		ŀ
Benzo(a)An	thracene	0.019	U	mg/L	EPA 827		01 09/		ŀ
Chrysene		0.019	U	mg/L	EPA 827		01 09/		ì
	lhexyl)Phthal	0.019	U	mg/L	EPA 827		01 09/		ŀ
di-n-Octyl		0.019	U	mg/L	EPA 827		01 09/		F
	uoranthene	0.019	U	mg/L	EPA 827		01 09/		Ì.
	uoranth en e	0.019	U	mg/L	EPA 827		01 09/		ì.
Benzo(a)Py		0.019	U	mg/L	EPA 827		01 09/		ŀ
	,3-cd)Pyrene	0.019	U	mg/L	EPA 827	0 09/	01 09/	04	1
)Anthracene	0.019	U	mg/L	EPA 827		01 09/		h
Benzo(g,h,	i)Perylene	0.019	U	mg/L	EPA 827	0 09/	01 09/	04	1

** See Sample Remarks Above

D = Secondary dilution.

UA = Unavailab

NA = Not Anal

LT = Less Than

GT = Greater Than



Member of the SGS Group (Société Générale de Surveillance)

See Special Instructions Above

U = Undetected, Reported value is the practical quantification limit.



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

:93.4356-11 Client Sample ID :LAY-LF01-SW08 POINT LAY

Matrix :WATER

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

Client Name

:ICF KAISER ENGINEERING

Ordered By Project Name

:DEW LINE RI/FS

Project#

:41096-412-01

PWSID :UA

:RAY MORRIS

WORK Order :70116

Report Completed :10/06/93

Collected :08/24/93 @ 15:15 hrs. Received :08/26/93 @ 12:00 hrs.

Technical Director: STEPHEN, C, EDE

Released By : \(\tag{1}\).

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.018		mg/L	EPA 8260		00/02	09/02	мам
Bromobenzene	0.0010	บ	mg/L	EPA 8260			09/02	MCM
Bromochloromethane	0.0010	Ü	mg/L	EPA 8260			09/02	MCM
Bromodichloromethane	0.0010	Ü	mg/L	EPA 8260				MCM
Bromoform	0.0010	Ü	mg/L	EPA 8260			09/02 09/02	MCM MCM
Bromomethane	0.0010	Ü	mg/L	EPA 8260			09/02	HCH
n-Butylbenzene	0.0010	บั	mg/L	EPA 8260			09/02	MCM
sec-Butylbenzene	0.0010	ŭ	mg/L	EPA 8260			09/02	MCM
tert-Butylbenzne	0.0010	ŭ	mg/L	EPA 8260			09/02	MCM
arbon Tetrachloride	0.0010	Ü	mg/L	EPA 8260			09/02	MCM
hlorobenzene	0.0010	Ü	mg/L	EPA 8260			09/02	MCM
Chloroethane	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
Chloroform	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
Chloromethane	0.0010	ŭ	mg/L	EPA 8260			09/02	MCM
2-Chlorotoluene	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
4-Chlorotoluene	0.0010	ŭ	mg/L	EPA 8260			09/02	
Dibromochloromethane	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
12Dibromo3Chloropropane	0.0010	บ	mg/L	EPA 8260			09/02	
1,2-Dibromoethane	0.0010	Ü	mg/L	EPA 8260				HCM
Dibromomethane	0.0010	Ü	mg/L	EPA 8260		09/02 09/02		MCM
1,2-Dichlorobenzene	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
1,3-Dichlorobenzene	0.0010	Ü	mg/L	EPA 8260		09/02		HCM
1,4-Dichlorobenzene	0.0010	Ü	mg/L	EPA 8260		09/02		MCM MCM
Dichlorodifluoromethane	0.034	•	mg/L	EPA 8260		09/02		
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02		MCM MCM
1,2-Dichloroethane	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
1,1-Dichloroethene	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
cis-1,2-Dichloroethene	0.0069	•	mg/L	EPA 8260		09/02		MCM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260	•	09/02		MCM
1,2-Dichloropropane	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
1,3-Dichloropropane	0.0010	Ū	mg/L	EPA 8260		09/02		MCM
2,2-Dichloropropane	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
1,1-Dichloropropene	0.0010	Ū	mg/L	EPA 8260		09/02		MCM
Ethylbenzene	0.0041	-	mg/L	EPA 8260		09/02		MCM
Hexachlorobutadiene	0.0010	U	mg/L	EPA 8260		09/02		MCM
Isopropylbenzene	0.0010	Ū	mg/L	EPA 8260		09/02		MCM
p-Isopropyltoluene	0.0017	-	mg/L	EPA 8260		09/02		MCM
			5/ 🐸	LL A 0200		03/02	03/02	ncn



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS SCE Chemlab Ref.# :93.4356-11

Client Sample ID :LAY-LF01-SW08 POINT LAY

Matrix :WATER ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

Methylene Chloride Napthalene n-Propylbenzene Styrene 1112-Tetrachloroethane 1122-Tetrachloroethane Tetrachloroethene Toluene 1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichloroethene Trichlorofluoromethane 1,2,3-Trichloropropane 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene Vinyl Chloride P+m-Xylene	0.0010 0.0010 0.0010 0.082 0.0072 0.0010 0.0010 0.0010 0.0033 0.0029 0.0010 0.010 0.010	mg/L mg/L mg/L U mg/L U mg/L U mg/L U mg/L U mg/L U mg/L U mg/L U mg/L U mg/L U mg/L U mg/L U mg/L U mg/L	EPA 8260 (W) -6.1 EPA 8260 (T) -J.1 EPA 8260 EPA 09/02		
Vinyl Chloride p+m-Xylene o-Xylene	0.0010 0.013 0.0087	U mg/L mg/L mg/L			

See Special Instructions Above

** See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable

NA = Not Analya

LT = Less Than

GT = Greater Than





ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4358-4

Client Sample ID :LAY-LF01-SW08 POINT LAY

Matrix

:WATER

5633 B STF ANCHORAGE. AK 9 TEL: (907) 562 FAX: (907) 561-

Client Name

:ICF KAISER ENGINEERING

Ordered By Project Name

:RAY MORRIS :DEW LINE RI/FS :41096-412-01

Project# PWSID

:UA

WORK Order

:70131

Report Completed Collected

:09/20/93 :08/24/93

Received

@ 15:15 :08/26/93 @ 12:00

Technical Director: STEPHEN C. EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: J.P.

Parameter	QC Results Qua	l Units	Method	Allowable Limits		Anal Date	_
Semivolatile Organics Phenol bis(2-Chloroethyl)ether 2-Chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene Benzyl Alcohol 1,2-Dichlorobenzene 2-Methylphenol bis(2-Chloroisopropyl)e 4-Methylphenol n-Nitroso-di-n-Propylam Hexachloroethane Nitrobenzene Isophorone 2-Nitrophenol 2,4-Dimethylphenol Benzoic Acid bis(2-Chloroethoxy)Meth 2,4-Dichlorophenol	0.011 U 0.011 U	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	EPA 8270 EPA 8270		09/01 09/01 09/01 09/01 09/01 09/01 09/01 09/01 09/01	09/04 09/04 09/04 09/04 09/04 09/04 09/04 09/04 09/04 09/04 09/04 09/04 09/04 09/04	
1,2,4-Trichlorobenzene Naphthalene 4-Chloroaniline Hexachlorobutadiene 4-Chloro-3-Methylphenol 2-Methylnaphthalene Hexachlorocyclopentadie 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronaphthalene 2-Nitroaniline Dimethylphthalate Acenaphthylene 2,6-Dinitrotoluene 3-Nitroaniline Acenaphthene 2,4-Dinitrophenol 4-Nitrophenol	0.011 U 0.011 U	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	EPA 8270 EPA 8270		09/01 09/01 09/01 09/01 09/01 09/01 09/01 09/01 09/01 09/01 09/01 09/01 09/01	09/04 09/04 09/04 09/04 09/04 09/04 09/04 09/04 09/04 09/04 09/04 09/04 09/04	



COMMERCIAL TESTING & ENGINEERING CO. ENVIRONMENTAL LABORATORY SERVICES

5-NCE -300	REPOR	T of ANAL	YSIS		
Chemlab Ref.# :93.4358-4	· ()				5633 BLANDET ANCHORAGE, AN. 3518
Client Sample ID :LAY-LF01-SW	08 POINT LAY	Comment			TEL: (907) 562-2343
Matrix :WATER	-33	暑			FAX: (907) 561-5301
mile C			0270		00/01 00/04 95
Dibenzofuran	0.011 U	mg/L	EPA 8270		09/01 09/04 MT
2,4-Dinitrotoluene	0.011 U	mg/L	EPA 8270		09/01 09/04 MT 09/01 09/04 MT
Diethylphthalate	0.011 U 0.011 U	mg/L	EPA 8270 EPA 8270		09/01 09/04 MT
4-Chlorophenyl-Phenylet	0.011 U 0.011 U	mg/L	EPA 8270		09/01 09/04 MT
Fluorene 4-Nitroaniline	0.011 U	mg/L mg/L	EPA 8270		09/01 09/04 MT
4,6-Dinitro-2-Methylphe	0.011 U	mg/L	EPA 8270		09/01 09/04 MT
n-Nitrosodiphenylamine	0.011 U	mg/L	EPA 8270		09/01 09/04 MT
4-Bromophenyl-Phenyleth	0.011 U	mg/L	EPA 8270		09/01 09/04 MT
Hexachlorobenzene	0.011 U	mg/L	EPA 8270		09/01 09/04 MT
Pentachlorophenol	0.011 U	mg/L	EPA 8270		09/01 09/04 MT
Phenanthrene	0.011 U	mg/L	EPA 8270		09/01 09/04 HT
Anthracene	0.011 U	mg/L	EPA 8270		09/01 09/04 MT
di-n-Butylphthalate	0.011 U	mg/L	EPA 8270		09/01 09/04 MT
Fluoranthene	0.011 U	mg/L	EPA 8270		09/01 09/04 MT
Pyrene	0.011 U	mg/L	EPA 8270		09/01 09/04 MT
Butylbenzylphthalate	0.011 U	mg/L	EPA 8270		09/01 09/04 MT
3,3-Dichlorobenzidine	0.011 U	mg/L	EPA 8270		09/01 09/04 MT
Benzo(a)Anthracene	0.011 U	mg/L	EPA 8270		09/01 09/04 MT 09/01 09/04 MT
Chrysene	0.011 U	mg/L	EPA 8270		09/01 09/04 MT
bis(2-Ethylhexyl)Phthal	0.011 U 0.011 U	mg/L	EPA 8270 EPA 8270		09/01 09/04 MT
di-n-Octylphthalate Benzo(b)Fluoranthene	0.011 U 0.011 U	mg/L mg/L	EPA 8270		09/01 09/04 MT
Benzo(k)Fluoranthene	0.011 U	ing/L	EPA 8270		09/01 09/04 MT
Benzo(a)Pyrene	0.011 U	ng/L	EPA 8270		09/01 09/04 MT
Indeno(1,2,3-cd)Pyrene	0.011 U	mg/L	EPA 8270		09/01 09/04 MT
Dibenz(a,h)Anthracene	0.011 U	mg/L	EPA 8270		09/01 09/04 MT
Benzo(g,h,i)Perylene	0.011 U	mg/L	EPA 8270		09/01 09/04 MT
Total Metals Analysis			-		
ICP Screen, ICF			EPA	n/a	
Aluminum	0.10 U	mg/L	EPA 6010		09/02 09/06 DL
Antimony	0.10 U	mg/L	EPA 6010		09/02 09/06 DL 09/02 09/06 DL
Arsenic	0.10 U	mg/L	EPA 6010		09/02 09/06 DL
Barium	0.20 0.050 U	mg/L mg/L	EPA 6010 EPA 6010		09/02 09/06 DL
Beryllium Cadmium	0.050 U 0.050 U	mg/L	EPA 6010		09/02 09/06 DL
Calcium	83	mg/L	EPA 6010		09/02 09/06 DL
Chromium	0.050 บ	mg/L	EPA 6010		09/02 09/06 DL
Cobalt	0.10 U	mg/L	EPA 6010		09/02 09/06 DL
Copper	0.050 U	mg/L	EPA 6010		09/02 09/06 DL
Iron	33	mg/L	EPA 6010		09/02 09/06 DL
Lead	0.10 U	mg/L	EPA 6010		.09/02 09/06 DLC
Magnesium	25	mg/L	EPA 6010		09/02 09/06 DL
Manganese	0.96	ng/L	EPA 6010		09/02 09/06 DLC
Molybdenum	0.050 U	mg/L	EPA 6010		09/02 09/06 DL: 09/02 09/06 DL:
Nickel	0.050 U	mg/L	EPA 6010		09/02 09/06 DLC
Potassium	8.1 0.10 U	mg/L mg/L	EPA 6010 EPA 6010		09/02 09/06 DL
Selenium	0.050 U ~	mg/L 1/	EPA 6010		09/02 09/06 DLC
Silver Sodium	47	mg/L - 1	EPA 6010		09/15 09/17 DET
JOGITAN	• 1	g/ L			
			•	2/3/94	
		,	HI Changus	2/3/04	•••
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SSS Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

> \CE FC4	REPOR	T of ANALYS	SIS			
Chemlab Ref.# :93.4358-4					5633 B STE ANCHORAGE, AK S	
Client Sample ID :LAY-LF01-SW08 PC	INT LAY	(BINENT			TEL: (907) 562	-2343
Matrix :WATER	3	J. M.			FAX: (907) 561	-5301
Thallium 0.00		mg/L	EPA 7841		09/03 09/08	Bh
Vanadium 0.05		mg/L	EPA 6010		09/02 09/06	DI
Zinc 0.05	0 U	mg/L	EPA 6010		09/15 09/17	DE
Dissolved Metals Analys	-		- .			
ICP Screen, ICF			EPA	n/a		
Aluminum 0.1		mg/L	EPA 6010		09/02 09/06	DE.
Antimony 0.1		mg/L	EPA 6010		09/02 09/06	DI
Arsenic 0.1		mg/L	EPA 6010		09/02 09/06	DL
Barium 0.2		mg/L	EPA 6010		09/02 09/06	DL
Beryllium 0.05	0 U	mg/L	EPA 6010		09/02 09/06	DI
Cadmium 0.05	50 U	mg/L	EPA 6010		09/02 09/06	DL
Calcium	33	mg/L	EPA 6010		09/02 09/06	DE
Chromium 0.05	0 U	mg/L	EPA 6010		09/02 09/06	DI
Cobalt 0.1		mg/L	EPA 6010		09/02 09/06	Dī
Copper 0.05	50 U	mg/L	EPA 6010		09/02 09/06	DI
	23	mg/L	EPA 6010		09/02 09/06	DI
Lead 0.1	LO U	mg/L	EPA 6010		09/02 09/06	DI
	25	mg/L	EPA 6010		09/02 09/06	DI
Manganese 0.9		mg/L	EPA 6010		09/02 09/06	DI
Molybdenum 0.09		mg/L	EPA 6010		09/02 09/06	DI
Nickel 0.0		mg/L	EPA 6010		09/02 09/06	DI
Potassium 8		mg/L	EPA 6010		09/02 09/06	Di
Selenium 0.:		mg/L	EPA 6010		09/02 09/06	DI
Silver 0.0			EPA 6010		09/02 09/06	D
	47	mg/L	EPA 6010		09/15 09/17	D£
Thallium 0.0		mg/L	EPA 7841		09/03 09/08	B :
Vanadium 0.0		mg/L	EPA 6010		09/02 09/06	D.
Zinc 0.0	50 บ	mg/L	EPA 6010		09/15_09/17	DE
TOC, Nonpurgable			EPA 9060	n/a		į
TOC Range 19.8-20	.9	mg/L	EPA 9060		09/07	CT.
TOC Concentration 20	. 4	mg/L	EPA 9060		09/07	C:
Residue, Non-Filterable	84	mg/L	EPA 160.2		08/31	T
Residue,Filterable(TDS) 8	70 J	mg/L A.l	EPA 160.1	500	09/01 09/02	R.

MI danses 2.5

Compiled: 5mf 11/24/94

UA = Unavailable

NA = Not Analyzed LT = Less Than

GT = Greater Than



Member of the SGS Group (Société Générale de Surveillance)

See Special Instructions Above

See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4692-9 Client Sample ID :LAY-LF01-25W09

Matrix

:WATER

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343

FAX: (907) 561-5301

Client Name Ordered By

:ICF KAISER ENGINEERING

Project Name Project#

:SHERI K ACE :DEW LINE RI/FS :41096-412-01

PWSID

:UA

WORK Order

:70792 Report Completed :10/01/93

Collected Received

@ 17:30 :09/07/93 :09/09/93 @ 12:00 hrs

Technical Director: STEPHEN C. EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA. EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL. **THESE COMPOUNDS WERE NOT CALIBRATED FOR AT THE TIME. SAMPLE HAD TO BE RUN FOR 8260 SO HOLDING TIMES WOULD NOT BE EXCEEDED. B = THIS FLAG IS USED WHEN THE ANALYTE IS FOUND IN THE ASSOCIATED BLANK AS WELL AS IN THE SAMPLE.

 Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	In it
Hydrocarbons VPH	0.223							
Hydrocarbons EPH	0.181		mg/L mg/L	EPA 5030/8015M 3510/3550/8100M		09/13	09/13	WLS
	0.101		g/ L	-310/3330/6100m		09/13	09/15	J BH
Volatile Organics				EPA 8260				
Benzene	0.013		mg/L	EPA 8260		00.420	00.400	
Bromobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	M
Bromochloromethane	0.0010	Ü	mg/L	EPA 8260			09/20	
Bromodichloromethane	0.0010	Ü	mg/L	EPA 8260			09/20	KWH
Bromoform	0.0010	ŭ	mg/L	EPA 8260			09/20	KWM
Bromomethane	0.0010	ij	mg/L	EPA 8260			09/20	KWH
n-Butylbenzene	0.0010	Ü	mg/L	EPA 8260			09/20	KWM
s ec -Butylbenzene	0.0010	Ŭ	mg/L	EPA 8260			09/20	KWH
tert-Butylbenzne	0.0010	Ü	mg/L	EPA 8260			09/20	KWM
Carbon Tetrachloride	0.0010	Ü	_			09/20		KWM
Chlorobenzene	0.0010	U	mg/L mg/L	EPA 8260 EPA 8260		09/20		KWM
Chloroethane	0.0010	Ū	mg/L	EPA 8260		09/20		KWM
Chloroform	0.0010	Ü	mg/L	EPA 8260		09/20		KWM
Chloromethane	0.0035	В				09/20		KWM
2-Chlorotoluene	0.0010	II.	mg/L mg/L	EPA 8260		09/20		KWM
4-Chlorotoluene	0.0010	Π		EPA 8260		09/20		KWM
Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/20		KWM
12Dibromo3Chloropropane	**	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260				
Dibromomethane	0.0010	IJ	mg/L	EPA 8260		09/20		KWM
1,2-Dichloropenzene	0.0010	IJ	mg/L	EPA 8260		09/20		KWM
1,3-Dichlorobenzene	0.0010	ij	mg/L	EPA 8260		09/20		KWM
1,4-Dichlorobenzene	0.0010	U II	mg/L	EPA 8260		09/20		KWM
Dichlorodifluoromethane	0.058	U	mg/L	EPA 8260		09/20		KWM
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/20		KWM
1,2-Dichloroethane	0.0010	Ü	mg/L	EPA 8260		09/20		KWM
1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/20		KWM
cis-1,2-Dichloroethene	0.0055	U	mg/L	EPA 8260		09/20		KWM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/20		KWM
1,2-Dichloropropane	0.0010	Ū	mg/L	EPA 8260		09/20		MILT
	3.0010	J	mg/L	EPA 8260		09/20	09/20	1
								_



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS Chemlab Ref.# :93.4692-9 5533 B STREET Client Sample ID :LAY-LF01-25W09 ANCHORAGE, AK 99518 TEL: (907) 562-2343 Matrix : WATER FAX: (907) 561-5301 1,3-Dichloropropane 0.0010 U mg/L EPA 8260 09/20 09/20 KWM 2,2-Dichloropropane 0.0010 i i mg/L EPA 8260 09/20 09/20 1,1-Dichloropropene KWM 0.0010 U mg/L EPA 8260 09/20 09/20 KWM Ethylbenzene 0.0036 EPA 8260 mg/L 09/20 09/20 Hexachlorobutadiene KWM EPA 8260 mg/L Isopropylbenzene 0.0010 mg/L **EPA** 8260 09/20 09/20 KWM p-Isopropyltoluene 0.0013 mg/L EPA 8260 09/20 09/20 KWM Methylene Chloride 0.0026 mg/L EPA 8260 09/20 09/20 KWM Napthalene mg/L EPA 8260 n-Propylbenzene 0.0010 U mg/L **EPA** 8260 09/20 09/20 KWM Styrene 0.0010 IJ **EPA** 8260 mq/L 09/20 09/20 1112-Tetrachloroethane KWM 0.0010 Ü EPA 8260 mg/L 09/20 09/20 1122-Tetrachloroethane KWM 0.0010 U EPA 8260 mg/L 09/20 09/20 Tetrachloroethene KWM 0.109 mg/L EPA 8260 09/20 09/20 Toluene KWM 0.0089 mq/L EPA 8260 09/20 09/20 1,2,3-Trichlorobenzene KWM ** mg/L **EPA** 8260 .,2,4-Trichlorobenzene ** mg/L **EPA** 8260 1,1,1-Trichloroethane 0.0010 11 mg/L **EPA** 8260 09/20 09/20 1,1,2-Trichloroethane KWM 0.0010 mg/L EPA 8260 09/20 09/20 Trichloroethene KWM 0.0029 mg/L EPA 8260 09/20 09/20 Trichlorofluoromethane KWM 0.0038 EPA 8260 mg/L 09/20 09/20 1,2,3-Trichloropropane KWM 0.0010 mq/L EPA 8260 09/20 09/20 1,2,4-Trimethylbenzene KWM 0.0093 mg/L EPA 8260 1,3,5-Trimethylbenzene 09/20 09/20 KWM 0.0051 mq/L EPA 8260 09/20 09/20 Vinyl Chloride KWM 0.0010 U mg/L EPA 8260 09/20 09/20 KWM P+m-Xylene 0.013 mg/L EPA 8260 09/20 09/20 o-Xylene KWM 0.0077

mg/L

EPA 8260

See Special Instructions Above UA = Unavailable See Sample Remarks Above

= Undetected, Reported value is the practical quantification limit. D = Secondary dilution.

NA = Not Analyzed LT = Less Than GT = Greater Than

09/20 09/20

KWM





REPORT of ANALYSIS

ENVIRONMENTAL LABORATORY SERVICES



5633 B STREET

FAX: (907) 561-5301

ANCHORAGE, AK 99518 TEL: (907) 562-2343

Chemlab Ref.#

Client Name

Ordered By

Project Name

Project#

PWSID

:ICF KAISER ENGINEERING

:93.4692-10 Client Sample ID :LAY-LF01-25W10

:SHERI K ACE

:DEW LINE RI/FS

:UA

:41096-412-01

:WATER

WORK Order :70792

Report Completed :10/01/93 Collected

:09/07/93 @ 17:45 :09/09/93 @ 12:00 hrs

Received

Technical Director: STEPHEN, C. EDE

Released By :

mester Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA. EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL. **THESE COMPOUNDS WERE NOT CARIBRATED FOR AT THE TIME. SAMPLE HAD TO BE RUN FOR 8260 SO HOLDING TIMES WOULD NOT BE EXCEEDED. 3 = THIS FLAG IS USED WHEN THE ANALYTE IS FOUND IN THE ASSOCIATED BLANK AS WELL AS IN THE SAMPLE.

OC Allowable Ext. Anal Parameter Results Qual Units Method Date Date Limits Init _____ Hydrocarbons VPH 0**.020** U mg/L EPA 5030/8015M 09/13 09/13 Hydrocarbons EPH WLS 0.240 mg/L 3510/3550/8100M 09/13 09/16 JBH Volatile Organics EPA 8260 Benzene 0.0011 mq/L EPA 8260 09/20 09/20 Bromobenzene 0.0010 U mg/L EPA 8260 09/20 09/20 Bromochloromethane м 0.0010 U mq/L EPA 8260 Bromodichloromethane 09/20 09/20 KWM 0.0010 U mg/L EPA 8260 09/20 09/20 KWM Bromoform 0.0010 U mq/L EPA 8260 09/20 09/20 Bromomethane KWH 0.0010 U mg/L EPA 8260 09/20 09/20 KWM n-Butylbenzene 0.0010 U mg/L EPA 8260 09/20 09/20 s**ec**-Butylbenzene KWM 0**.0010** ប mg/L EPA 8260 09/20 09/20 tert-Butylbenzne KWM 0.0010 U EPA 8260 mg/L 09/20 09/20 Carbon Tetrachloride KWM 0.0010 U EPA 8260 mg/L 09/20 09/20 Chlorobenzene KWM 0.0010 mg/L EPA 8260 Chloroethane 09/20 09/20 KWM 0.0010 U mg/L EPA 8260 09/20 09/20 Chloroform KWM 0.0010 U mg/L EPA 8260 09/20 09/20 Chloromethane KWM 0.0083 B mg/L EPA 8260 09/20 09/20 2-Chlorotoluene KWM 0.0010 U mg/L EPA 8260 09/20 09/20 4-Chlorotoluene KWM 0.0010 U EPA 8260 mg/L 09/20 09/20 Dibromochloromethane KWM 0.0010 U mq/L EPA 8260 09/20 09/20 12Dibromo3Chloropropane KWM mg/L EPA 8260 1,2-Dibromoethane 0.0010 U mg/L EPA 8260 09/20 09/20 KWM Dibromomethane 0.0010 U mg/L EPA 8260 09/20 09/20 1,2-Dichlorobenzene KWM 0.0010 U mg/L EPA 8260 09/20 09/20 1,3-Dichlorobenzene KWM 0.0010 U EPA 8260 mg/L 09/20 09/20 1,4-Dichlorobenzene KWM 0.0010 U EPA 8260 mg/L 09/20 09/20 Dichlorodifluoromethane KWM 0.0010 U mg/L EPA 8260 09/20 09/20 KWM 1,1-Dichloroethane 0.0010 U mg/L EPA 8260 09/20 09/20 KWM 1,2-Dichloroethane 0.0010 U mg/L EPA 8260 09/20 09/20 1,1-Dichloroethene KWM 0.0010 U mg/L EPA 8260 09/20 09/20 **KWM** cis-1,2-Dichloroethene 0.0010 U mg/L EPA 8260 09/20 09/20 trans1,2-Dichloroethene KWM 0.0010 U mg/L EPA 8260 09/20 09/20 1,2-Dichloropropane 0.0010 U mg/L EPA 8260 09/20 09/20



o-Xylene

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS Chemlab Ref. # :93.4692-10 5633 B STREET Client Sample ID :LAY-LF01-25W10 ANCHORAGE, AK 99518 Matrix EL: (907) 562-2343 :WATER FAX: (907) 561-5301 1,3-Dichloropropane 0.0010 П 2.2-Dichloropropane mg/L EPA 8260 09/20 09/20 KWP 0.0010 Ü mq/L EPA 8260 1,1-Dichloropropene 09/20 09/20 KWF 0.0010 U mg/L EPA 8260 09/20 09/20 Ethylbenzene KWE: 0.0010 U mg/L Hexachlorobutadiene EPA 8260 09/20 09/20 KWI. ** mq/L EPA 8260 Isopropylbenzene 0.0010 Ħ mg/L EPA 8260 09/20 09/20 p-Isopropyltoluene KWK. 0.0010 U EPA 8260 mg/L Methylene Chloride 09/20 09/20 KWM 0.0010 U mq/L EPA 8260 09/20 09/20 Napthalene KWM mg/L EPA 8260 n-Propylbenzene 0.0010 U mg/L EPA 8260 Styrene 09/20 09/20 KWM 0.0010 U mg/L EPA 8260 1112-Tetrachloroethane 09/20 09/20 KWM 0.0010 U mg/L EPA 8260 1122-Tetrachloroethane 09/20 09/20 KWM 0.0010 U mg/L EPA 8260 Tetrachloroethene 09/20 09/20 KWM 0.0010 U mg/L EPA 8260 09/20 09/20 Toluene KWM 0.0010 U mg/L EPA 8260 1,2,3-Trichlorobenzene 09/20 09/20 KWM mg/L EPA 8260 1,2,4-Trichlorobenzene ** mg/L EPA 8260 1,1,1-Trichloroethane 0.0010 П mg/L EPA 8260 09/20 09/20 1,1,2-Trichloroethane **KWM** 0.0010 H EPA 8260 mg/L 09/20 09/20 Trichloroethene KWM 0.0010 U mg/L **EPA** 8260 Trichlorofluoromethane 09/20 09/20 KWM 0.0010 U mg/L EPA 8260 1,2,3-Trichloropropane 09/20 09/20 KWM 0.0010 U mg/L EPA 8260 1,2,4-Trimethylbenzene 09/20 09/20 KWM 0.0010 mg/L EPA 8260 1,3,5-Trimethylbenzene 09/20 09/20 KWM 0.0010 mg/L EPA 8260 Vinyl Chloride 09/20 09/20 KWM 0.0010 U mg/L EPA 8260 P+m-Xylene 09/20 09/20

See Special Instructions Above See Sample Remarks Above

= Undetected, Reported value is the practical quantification limit. D = Secondary dilution.

0.0010

0.0010

U

U

mg/L

mg/L

EPA 8260

EPA 8260

UA = Unavailable

KWH

KWM

KWM

09/20 09/20

09/20 09/20

NA = Not Analyzed LT = Less Than

GT = Greater Than



Member of the SGS Group (Société Générale de Surveillance)

ICF ID	LAY-LF01-SD01	LAY-LF01-SD02	LAY-LF01-SD03 482	LAY-LF01-SD04 484	
F&BI Number	478	480	soil	soil	
Sample Type	soil	soil 8/24/93	8/24/93	8/24/93	
Date Received	8/24/93 32	6/24/93 26	94	85	_
% Dry Weight	#5-08/25/93	#5-08/25/93	#5-08/25/93	#5-08/25/93	
Sequence Date Leaded Gas	#5-06/25/93	#0-00/20/30	#3-00/23/33	#3 00/23/30	
JP-4	<150	< 200	<50	<60	
Lube Oil	<300	<400	<100	<120	
Diesel	< 150 < 160	<200 <190		<60	
Spike Level	<i>y</i> 2100 100	1,000 1170	100	,	
Unknown Semi-volatile					
Pentacosane	106	102	97	97	
Sequence Date	#5-08/25/93	#5-08/25/93	#5-08/25/93	#5-08/25/93	
PCB 1221	<011 40.3	40.1 40.4	< 0.1	< 0.1	
PCB 1232	dol1 40.3	<0.1 <0.4	< 0.1	< 0.1	
PCB 1016	< 0.1 40.3	< d/1 40.4	< 0.1	< 0.1	
PCB 1242	< 1 40.3	<0/1 40.4	< 0.1	< 0.1	
PCB 1248	<0.1 40.3	< 0.1 40.4	< 0.1	< 0.1	
PCB 1254	<0.1 40.3	<\psi.1 < 0.4	< 0.1	< 0.1	
PCB 1260	<0.1 40.3	40.1 €0.5	/ <0.1	< 0.1	
Spike Level	•		•		
Dibutyl Chlorendate	106	102	97	97	
Sequence Date				#5-08/25/93	
alpha-BHC				< 0.02	
beta-BHC				< 0.02	
gamma-BHC				< 0.02	
delta-BHC				< 0.02	
Heptachlor				< 0.02	
Aldrin				< 0.02	
Heptachlor Epoxide				< 0.02	
Endosulfan I				< 0.02	
DDE				< 0.02	
Dieldrin				<0.02 <0.02	
Endrin				< 0.02	
Endosulfan II DDD				< 0.02	
Endrin Aldehyde				< 0.02	
DDT				< 0.02	
Endosulfan Sulfate				< 0.02	
Endrin Ketone				< 0.02	
Methoxy Chlor				< 0.1	
Chlordane				< 0.5	
Dibutyl Chlorendate				97	
Spike Level					
Vol Sequence	#1&2-08/25/93	#1&2-08/25/93	#1&2-08/25/93	#1&2-08/25/93	
CCI4	<0.07 ブ	<0.07 J	< 0.02 5	<0.03 🛨	
TCA	<0.07 3	<0.07 J	<0.02 ₮	<0.03 🍞	
Benzene	< 0.07	< 0.07	< 0.02	< 0.03	
TCE	<0.07 5	<0.07 5	<0.02 3	<0.03 🏕	
Toluene	<0.07 <0.6	<0.07	< 0.02	0.03	
PCE	<0.07 5	<0.07 5	<0.02 5	<0.03 5	
Ethylbenzene	< 0.07 < 1.7	<0.07	< 0.02	< 0.03	
Xylenes	~0.14 ^{∠1.3}	۲۰۰۷ ۱۹۰ ۵>	<0.04	<0.06	
Gasoline	£5 (37.3	5 57 443	54 <1 J	£3 <13	
Spike level	440	00	00	. 01 =	_
BFB	119	89	89	91 RS	B
				6-1	14-95

ICF ID	LAY-LF01-SD05	LAY-LF01-SD06	LAY-LF01-SD07	LAY-LF01-SD08
F&BI Number	486	488	490	492
Sample Type	soil	soil	soil	soil
Date Received	8/24/93	8/24/93	8/24/93	8/24/93
% Dry Weight	89	61	88	60
Sequence Date	#5-08/25/93	#5-08/25/93	#5-08/25/93	#5-08/25/93
Leaded Gas				
JP-4	<60	<100	<60	< 100
Lube Oil	<120	<200	<120	< 200
Diesel	<60 R	<100 <80	<60	<100
Spike Level	•	•		
Unknown Semi-volatile				
Pentacosane	97	95	98	101
Sequence Date	#5-08/25/93	#5-08/25/93	#5-08/25/93	#5-08/25/93
PCB 1221	< 0.1	₹0.1/\ <0	U.7 <0.1	40.1 <0.2
PCB 1232	< 0.1	< 0.1// 4	ሪ. 겫 <0.1	<0/1 <0.2
PCB 1016	< 0.1	<0\1/ 40	o. ? <0.1	< X 1 40.7
PCB 1242	< 0.1	<0// <0	· て <0.1	 //1 <0.7
PCB 1248	< 0.1	<ø,∕1\ <¢	パス <0.1	40.1 <0.2
PCB 1254	< 0.1		›· ረ <0.1	₹0.1 ⟨0.2
PCB 1260	< 0.1	⊭ 0.1 <0	0.1>	£0.1 40.2
Spike Level				
Dibutyl Chlorendate	97	95	98	101
Sequence Date				#5-08/25/93
alpha-BHC				< 0.02
beta-BHC				< 0.02
gamma-BHC				< 0.02
delta-BHC				< 0.02
Heptachlor				< 0.02
Aldrin				< 0.02
Heptachlor Epoxide				< 0.02
Endosulfan I				<0.02
DDE				< 0.02
Dieldrin				<0.02
Endrin				< 0.02
Endosulfan II				< 0.02
DDD 5 old Aldele I				<0.02
Endrin Aldehyde DDT				< 0.02
Endosulfan Sulfate				<0.02 <0.02
Endosultait Sultate Endrin Ketone				< 0.02
Methoxy Chlor				<0.02
Chlordane				<0.5
Dibutyl Chlorendate				101
Spike Level				101
Vol Sequence	#1&2-08/25/93	#1&2-08/25/93	#1&2-08/25/93	#1&2-08/25/93
CCI4	<0.03 3	<0.04 3	<0.03 3	<0.04 ⋾
TCA	<0.03 5	<0.04 5	<0.03 五	<0.04 5
Benzene	< 0.03	< 0.04	< 0.03	<0.04
TCE	<0.03 C E0.05	<0.04 <0.04 J	<0.03 ~	<0.04 5
Toluene	< 0.03	< 0.04	< 0.03	< 0.04
PCE	<0.03 ± 0.03	<0.04 <0.04 5	<0.03 <0.03 ゴ	0.4 🏅
Ethylbenzene	< 0.03	< 0.04	< 0.03	< 0.04
Xylenes	< 0.06	< 0.08	< 0.06	< 0.08
Gasoline	43 KIJ	£4 423		S4 425
Spike level	-	•		
BFB	96	82	84	87
		• •	- -	95

6-14-95

ICF ID			 · · · - · · -	_AY-LF01-SW01
F&BI Number	494	496	498 	559
Sample Type	soil	soil	soil	water 8/25/93
Date Received	8/24/93	8/24/93	8/24/93	6/25/93
% Dry Weight	50	83	12	#5-08/27/93
Sequence Date	#5-08/25/93	#5-08/25/93	#5-08/25/93	#5-08/27/93
Leaded Gas		.00	<400	<1000
JP-4	<100	< 60	< 400 < 800	<2000
Lube Oil	< 200	<120	< 400 < 400	<1000
Diesel	<100	<60	< 400	~1000
Spike Level				
Unknown Semi-volatile	99	100	106	78
Pentacosane	#5-08/25/93	#5-08/25/93	#5-08/25/93	#5-08/27/93
Sequence Date	#5-06/25/93 K0.1 40.2	*9-08/25/55 <0.1	<0.√0 < 0.8	<2
PCB 1221	\$0.1 40.2	<0.1	< 0/1 < 0.8	<2
PCB 1232	<0/1 40.2	<0.1	<01 40.8	<2
PCB 1016	<0/1 40.2	<0.1	<0.1 <0.8	<2
PCB 1242	<0.1 40.2	<0.1	<0.1 <0.8	< 2
PCB 1248	<0.7 <0.3	<0.1	₹0.1 <0.8	<2
PCB 1254	10.7 20.2		20.1 43.8	<2
PCB 1260	40.1	\0.1	1014	
Spike Level	99	100	106	78
Dibutyl Chlorendate Sequence Date	55	100		
alpha-BHC				
beta-BHC				
gamma-BHC				
delta-BHC				
Heptachlor				#
Aldrin				
Heptachlor Epoxide				
Endosulfan I				
DDE				
Dieldrin				
Endrin				
Endosulfan II				
DDD				
Endrin Aldehyde				
DDT				
Endosulfan Sulfate				
Endrin Ketone				
Methoxy Chlor				
Chlordane				
Dibutyl Chlorendate				
Spike Level	#1&2-08/25/93	#1&2-08/25/93	#1&2-08/25/93	
Vol Sequence	<0.05	<0.03 \$	<0.2 \(\mathcal{T} \)	
CCI4	<0.05 3	<0.03 3	<0.2 3	
TCA	< 0.05	< 0.03	< 0.2	
Benzene TCE	<0.05 5	<0.03 ブ	<0.2 3	
Toluene	< 0.05	< 0.03	<0.2	
PCE	<0.05 万	<0.03 <i>5</i>	<0.2 5	
Ethylbenzene	< 0.05	< 0.03	<0.2	#
Xylenes	<0.1	< 0.06	<0.4	
Gasoline	<5 423	K3 41 J	<20 4 8 €	7
Spike level	#V -7 -2		_ , •	
BFB	90	93	85	RSB
-, -				100 HAR
				•

ICF ID F&BI Number	LAY-LF01-SW01 592	LAY-LF01-SW02 560	LAY-LF01-SW02 597	LAY-LF01-SW03 561
Sample Type Date Received % Dry Weight	water 8/25/93	water 8/25/93	water 8/25/93	water 8/25/93
Sequence Date Leaded Gas		#5-08/27/93		#5-08/27/93
JP-4		<1000		<1000
Lube Oil		< 2000		<2000
Diesel		<1000		<1000
Spike Level				
Unknown Semi-volatile				•
Pentacosane		84		93
Sequence Date		#5-08/27/93		#5-08/27/93
PCB 1221		<2		<2
PCB 1232		<2		<2
PCB 1016 PCB 1242		<2 <2		<2 <2
PCB 1248		< 2 < 2		<2
PCB 1254		<2		<2
PCB 1260		<2		<2
Spike Level		~2		~2
Dibutyl Chlorendate		84		93
Sequence Date				
alpha-BHC				
beta-BHC				
gamma-BHC				
delta-BHC				
Heptachlor				,
Aldrin				
Heptachlor Epoxide	•			
Endosulfan I				
DDE Dieldrin				
Endrin				
Endosulfan II				
DDD				
Endrin Aldehyde DDT				
Endosulfan Sulfate				
Endrin Ketone				
Methoxy Chlor				
Chlordane				
Dibutyl Chlorendate				
Spike Level Vol Sequence	#3&4-08/25/93		#28:4 00/25/02	
CCI4	#3&4-06/25/93 <1		#3&4-08/25/93 <1	
TCA	<1		<1	
Benzene	<1		<1	
TCE	<1		<1	
Toluene	<1		<1	
PCE	<1		<1	
Ethylbenzene	<1		<1	
Xylenes	<2		<2	
Gasoline	£50 4100	2	SEO < 100	2
Spike level				O-B
BFB	93		96	K2014-82

ICF ID F&BI Number Sample Type Date Received	LAY-LF01-SW03 598 water 8/25/93	LAY-LF01-SW04 562 water 8/25/93	LAY-LF01-SW04 601 water 8/25/93	LAY-LF01-SW05 563 water 8/25/93
% Dry Weight Sequence Date Leaded Gas		#5-08/27/93		#5-08/27/93
JP-4 Lube Oil		<1000 <2000		<1000 <2000
Diesel		<1000		<1000
Spike Level				
Unknown Semi-volatile Pentacosane		89		100
Sequence Date		#5-08/27/93		#5-08/27/93
PCB 1221		<2		<2
PCB 1232		<2		<2
PCB 1016		<2		<2
PCB 1242		<2		<2 <2
PCB 1248		<2		<2
PCB 1254		<2 <2		<2
PCB 1260 Spike Level		~2		· -
Dibutyl Chlorendate		89		100
Sequence Date		#5-08/27/93		
alpha-BHC		< \$ 40.2		
beta-BHC		< 2 40.2		
gamma-BHC		<2 40.2 <2 40.2	7	
delta-BHC		L		
Heptachlor Aldrin			2	
Heptachlor Epoxide		<2 40.2		
Endosulfan l		42 ८०.२		
DDE		42 40.2		
Dieldrin		42 ⟨ 0. 2	~	
Endrin		<2 < 0 ≥ <2 < 0 ≥	5	
Endosulfan II		<2 40.2	2	
DDD Endrin Aldehyde		<2 40.2	. 3	
DDT		<2 43.7	7.7	
Endosulfan Sulfate		 2 4>.2	. 3	
Endrin Ketone		< 2 402		
Methoxy Chlor		£20 LIO	<u>z</u>	
Chlordane		<50 ∠ 10 3)	
Dibutyl Chlorendate		89		
Spike Level Vol Sequence	#3&4-08/25/93	•	#3&4-08/25/93	
CCI4	<1		<1	
TCA	<1		<1	
Benzene	<1		23	
TCE	<1		<1	
Toluene	<1		9 93	
PCE Ethylhanzana	<1 <1		10 T	
Ethylbenzene Xylenes	<2		20 5	
Gasoline	550 ∠ 100 £	5	≤ 50 < 100	2
Spike level			- · · - -	
BFB	113		96	758 H-9

F8 Sa Da	CF ID &BI Number ample Type ate Received Dry Weight	604 water 8/25/93	LAY-LF01-SW06 564 water 8/25/93	LAY-LF01-SW06 608 dup water 8/25/93	LAY-LF01-SW06 609 water 8/25/93
Se	equence Date eaded Gas		#5-08/27/93		
JF	P-4		< 1000		
Lu	ube Oil		<2000		
Di	iesel		<1000		
Sp	pike Level				
Ur	nknown Semi-volatile				
	entacosane		98		
	equence Date		#5-08/27/93		
	CB 1221		<2		
	CB 1232		<2		
	CB 1016 CB 1242		<2		
	CB 1242 CB 1248		<2 <2		
	CB 1254		<2		
	CB 1260		<2		
	pike Level		\Z		
-	ibutyl Chlorendate		98		
Se	equence Date				
	pha-BHC				
	eta-BHC				
-	amma-BHC				
	elta-BHC				
	eptachlor				
	ldrin eptachlor Epoxide				
	ndosulfan I				
	DE				
	ieldrin				
	ndrin				
	ndosulfan II				
DI	DD				
	ndrin Aldehyde				
	DT				
	ndosulfan Sulfate				
	ndrin Ketone				
	lethoxy Chlor				
	hlordane ibutyl Chlorendate				
	pike Level				
	ol Sequence	#3&4-08/25/93		#3&4-08/25/93	#3&4-08/25/93
	CI4	*3&+-00/23/33 <1		*3&4-06/25/35 <1	#3&4-00/25/95 <1
	CA	<1		<1	<1
Ве	enzene	<1		<1	<1
T	CE	<1		<1	<1
To	oluene	<1		<1	<1
P	CE	<1		<1	<1
	thylbenzene	<1		<1	<1
	ylenes	<2	_	<2	<2
	asoline	£50 < 100	2	<50 <100 J	50 < 100 J
	pike level	0.5			. .
ВІ	FB	88		89	98
					18-4-1-11 PM
					•

ICF ID	LAY-LF01-SW07	LAY-LF01-SW07	LAY-LF01-SW08	LAY-LF01-SW08	
F&BI Number	565	612	566	613	
Sample Type	water	water	water	water	
Date Received	8/25/93	8/25/93	8/25/93	8/25/93	
% Dry Weight					
Sequence Date	#5-08/27/93		#5-08/27/93		
Leaded Gas					
JP-4	<1000		<1000		
Lube Oil	<2000		< 2000		
Diesel	<1000 \(\square\)		<1000 ブ		
Spike Level					
Unknown Semi-volatile					
Pentacosane	110		109		
Sequence Date	#5-08/27/93		#5-08/27/93		
PCB 1221	<2		<2		
PCB 1232	<2		<2		
PCB 1016	<2		<2		
PCB 1242	< 2		<2		
PCB 1248	<2		<2		
PCB 1254	< 2		<2		
PCB 1260	<2		<2		
Spike Level					
Dibutyl Chlorendate	110		109		
Sequence Date			#5-08/27/93	•	
alpha-BHC			42 40.23	7	
beta-BHC			2 40.2	7	
gamma-BHC			1 -	7	
delta-BHC					
Heptachlor			£2 40.23		
Aldrin			\$2 <0.2		
Heptachlor Epoxide			< 5 < 9.5		
Endosulfan I			<5 <2.5	3	
DDE			<2 <0.2	3	
Dieldrin			1	.	
Endrin			<2 40.2 <2 40.2	2	
Endosulfan II			<2 40.2	: 3	
DDD Endrin Aldebyde			<2 40.2	2	
Endrin Aldehyde DDT			<2 43.2	. Σ	
Endosulfan Sulfate			 	2 3	
Endrin Ketone			<2 ∠0.2	. 2	
Methoxy Chlor			<20 <103	•	
Chlordane			<50 4103		
Dibutyl Chlorendate			110		
Spike Level					
Vol Sequence		#3&4-08/25/93		#3&4-08/25/93	
CCI4		<1		<1	
TCA		<1		<1	
Benzene		<1		20	
TCE		<1		<1	
Toluene		<1		7	
PCE		<1		80 _	
Ethylbenzene		<1		13 💆	
Xylenes		<2		20 5	
Gasoline		S50 < 100.	7	£50 < 100	3
Spike level					
BFB		96		92	
				_	1

758 14-96

ANALYTICAL DATA SHEETS FOR GARAGE (SS06)



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.#

:93.4354-4

Client Sample ID :LAY-SS06-S03 POINT LAY

Matrix

:SOIL

Client Name

:ICF KAISER ENGINEERING

Ordered By Project Name

:RAY MORRIS :DEW LINE RI/FS

Project#

:41096-412-01

PWSID

:UA

WORK Order

:70106

Report Completed :10/07/93 Collected

:08/24/93 @ 11:50 hrs

Received :08/26/93 @ 12:00 hrs Technical Director:STEPHEN C. EDE Released By:

5633 B STREET

TEL: (907) 562-2343 FAX: (907) 561-5301

ANCHORAGE, AK 99518

Released By :

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C.

(malifier / Comments

Parameter	QC Results Qua	l Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics			EPA 8260				
Benzene	0.020 U	mg/Kg	EPA 8260(J)	- A I	08/26	09/13	KWM
Bromobenzene	0.020 U	mg/Kg	EPA 8260	/1		09/13	KWH
Bromochloromethane	0.020 U	mg/Kg	EPA 8260			09/13	KWM
Bromodichloromethane	0.020 U	mg/Kg	EPA 8260 \			09/13	KWM
Bromoform	0.020 U	mg/Kg	EPA 8260			09/13	KWM
Bromomethane	0.020 U	mg/Kg	EPA 8260			09/13	KWM
n-Butylbenzene	0.020 U	mg/Kg	EPA 8260			09/13	KWM
sec-Butylbenzene	0.020 U	mg/Kg	EPA 8260			09/13	KWM
tert-Butylbenzne	0.020 U	mg/Kg	EPA 8260			09/13	KWM
Carbon Tetrachloride	0.020 - U	mg/Kg	EPA 8260			09/13	KWM
Chlorobenzene	0.020 U	mg/Kg	EPA 8260			09/13	KWM
Chloroethane	0.020 U	mg/Kg	EPA 8260			09/13	KWM
Chloroform	0.020 U	mg/Kg	EPA 8260			09/13	KWM
Chloromethane	0.020 U	mg/Kg	EPA 8260			09/13	KWM
2-Chlorotoluene	0.020 U	mg/Kg	EPA 8260			09/13	KWM
4-Chlorotoluene	0.020 U	mg/Kg	EPA 8260		08/26	09/13	KWM
Dibromochloromethane	0.020 U	mg/Kg	EPA 8260			09/13	KWM
12Dibromo3Chloropropane	0.020 U	mg/Kg	EPA 8260			09/13	KWM
1,2-Dibromoethane	0.020 U	mg/Kg	EPA 8260		08/26	09/13	KWM
Dibromomethane	0.020 U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,2-Dichlorobenzene	0.020 U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,3-Dichlorobenzene	0.020 U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,4-Dichlorobenzene	0.020 บ	mg/Kg	EPA 8260		08/26	09/13	KWM
Dichlorodifluoromethane	0.020 U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,1-Dichloroethane	0.020 U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,2-Dichloroethane	0.020 U	mg/Kg	EPA 8260		08/26	09/13	KWM
1,1-Dichloroethene	0.020 U	mg/Kg	EPA 8260			09/13	KWM
cis-1,2-Dichloroethene	0.022	mg/Kg	EPA 8260			09/13	KWM
trans1,2-Dichloroethene	0.020 U	mg/Kg	EPA 8260			09/13	KWM
1,2-Dichloropropane	0.020 U	mg/Kg	EPA 8260			09/13	KWM
1,3-Dichloropropane	0.020 U	mg/Kg	EPA 8260			09/13	KWM
2,2-Dichloropropane	0.020 U	mg/Kg	EPA 8260			09/13	KWM
1,1-Dichloropropene	0.020 U	mg/Kg	EPA 8260			09/13	KWM
Ethylbenzene	0.023	mg/Kg	EPA 8260			09/13	KWM
Hexachlorobutadiene	0.020 U	mg/Kg	EPA 8260			09/13	KWM
Isopropylbenzene	0.020 U	mg/Kg	EPA 8260			09/13	KWM
p-Isopropyltoluene	0.042	mg/Kg	EPA 8260 ★		08/26	09/13	KWM



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COMMERCIAL TESTING & ENGINEERING CO. ENVIRONMENTAL LABORATORY SERVICES

Co. (Line		/	
SINCE 1908	REPORT of ANAL	ysis XX	5633 B STREET
Chemlab Ref.# :93.4354-4			
Client Sample ID :LAY-SS06-S03	POINT LAY	Qualifier/Comments	TEL: (907) 562-2343
Matrix :SOIL		Children (to Minates	FAX: (907) 561-5301
HIGGELY			
Methylene Chloride	0.023 mg/Kg	EPA 8260(J) -A.1	08/26 09/13 KWM
Napthalene	0.158 mg/Kg	EPA 8260	08/26 09/13 KWM
n-Propylbenzene	0.020 U mg/Kg	EPA 8260	08/26 09/13 KWM
	0.020 U mg/Kg		08/26 09/13 KWM
Styrene	0.020 U mg/Kg		08/26 09/13 KWM
1112-Tetrachloroethane	0.020 U mg/Kg		08/26 09/13 KWM
1122-Tetrachloroethane			08/26 09/13 KWM
Tetrachloroethene			08/26 09/13 KWM
Toluene	0.094 mg/Kg		08/26 09/13 KWM
1,2,3-Trichlorobenzene	0.020 U mg/Kg		08/26 09/13 KWM
1,2,4-Trichlorobenzene	0.020 U mg/Kg		
1,1,1-Trichloroethane	0.020 U mg/Kg		
1,1,2-Trichloroethane	0.020 U mg/Kg		08/26 09/13 KWM
Trichloroethene	0.020 U mg/Kg		08/26 09/13 KWM
Trichlorofluoromethane	0.020 U mg/Kg		08/26 09/13 KWM
1,2,3-Trichloropropane	0.020 U mg/Kg		08/26 09/13 KWM
1,2,4-Trimethylbenzene	0.315 mg/Kg		08/26 09/13 KWM
1,3,5-Trimethylbenzene	0.497 mg/Kg		08/26 09/13 KWM
Vinyl Chloride	0.020 U mg/Kg		08/26 09/13 KWM
p+m-Xylene	0.366 mg/Kg		08/26 09/13 KWM
o-Xylene	0.483 mg/Kg	EPA 8260 ♥	08/26 09/13 KWM
Semivolatile Organics		EPA 8270	
Phenol	2.20 U mg/Kg		09/06 09/30 T 09/06 09/30 T
his(2-Chloroethyl)ether	2.20÷ U mg/Kg		
2-Chlorophenol	2.20 U mg/Kg		09/06 09/30 MTT
1,3-Dichlorobenzene	2.20 U mg/Kg		09/06 09/30 MTT
1,4-Dichlorobenzene	2.20 U mg/Kg	EPA 8270	09/06 09/30 MTT
Benzyl Alcohol	2.20 U mg/Kg	EPA 8270	09/06 09/30 MTT
1,2-Dichlorobenzene	2.20 U mg/Kg	EPA 8270	09/06 09/30 MTT
2-Methylphenol	2.20 U mg/Kg	EPA 8270	09/06 09/30 MTT
bis(2-Chloroisopropyl)e	2.20 U mg/Kg	EPA 8270	09/06 09/30 MTT
4-Methylphenol	2.20 U mg/Kg	EPA 8270	09/06 09/30 MTT
n-Nitroso-di-n-Propylam	2.20 U mg/Kg	EPA 8270	09/06 09/30 MTT
Hexachloroethane	2.20 U mg/Kg	EPA 8270	09/06 09/30 MTT
	2.20 U mg/Kg	EPA 8270	09/06 09/30 MTT
Nitrobenzene Isophorone	2.20 U mg/Kg	EPA 8270	09/06 09/30 MTT
	2.20 U mg/Kg	EPA 8270	09/06 09/30 MTT
2-Nitrophenol	2.20 U mg/Kg	EPA 8270	09/06 09/30 MTT
2,4-Dimethylphenol Benzoic Acid	2.20 U mg/Kg	EPA 8270	09/06 09/30 MTT
bis(2-Chloroethoxy)Meth	2.20 U mg/Kg	EPA 8270	09/06 09/30 MTT
2.4 Dishlerenbook	2.20 U mg/Kg	EPA 8270	09/06 09/30 MTT
2,4-Dichlorophenol	2.20 U mg/Kg	EPA 8270	09/06 09/30 MTT
1,2,4-Trichlorobenzene	<u> </u>	EPA 8270	09/06 09/30 MTT
Naphthalene		EPA 8270	09/06 09/30 HTT
4-Chloroaniline		EPA 8270	09/06 09/30 HTT
Hexachlorobutadiene	2.20 U mg/Kg	EPA 8270	09/06 09/30 MTT
4-Chloro-3-Methylphenol	2.20 U mg/Kg	EPA 8270 EPA 8270	09/06 09/30 MTT
2-Methylnaphthalene	2.20 U mg/Kg		09/06 09/30 MTT
Hexachlorocyclopentadie	2.20 U mg/Kg	EPA 8270	09/06 09/30 MTT
2,4,6-Trichlorophenol	2.20 U mg/Kg	EPA 8270	09/06 09/30 MTT
2,4,5-Trichlorophenol	2.20 U mg/Kg	EPA 8270	09/06 09/30 MII
2-Chloronaphthalene	2.20 U mg/Kg	EPA 8270	03/00 03/30
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COMMERCIAL TESTING & ENGINEERING CO. ENVIRONMENTAL LABORATORY SERVICES

									
	5-ACE 1908		REPO	RT of ANAL	LYSIS WC				
	Chemlab Ref.# :93.4354-4				,		ANCHO	5633 B STR ORAGE, AK 99	
_ (Client Sample ID :LAY-SS06-S03	POINT	LAY	Swals			T	EL: (907) 562-2	2343
1	Matrix :SOIL		aulie	1 2			FA	AX: (907) 561-	5301
			G,	13, 1					
	2-Nitroaniline	2.20	U	mg/Kg $\stackrel{\smile}{}$	EPA 8270			09/30	MTT
	Dimethylphthalate	2.20	U	mg/Kg	EPA 8270		09/06		MTT
	Acenaphthylene	2.20	U	mg/Kg	EPA 8270			09/30	MTT
	2,6-Dinitrotoluene	2.20	Ü	mg/Kg	EPA 8270			09/30	MTT
	3-Nitroaniline	2.20	U	mg/Kg	EPA 8270			09/30	MTT
	Acenaphthene	2.20	Ü	mg/Kg	EPA 8270		09/06	09/30	MTT
	2,4-Dinitrophenol	2.20	U ·	mg/Kg	EPA 8270		09/06	09/30	MTT
	4-Nitrophenol	2.20	U	mg/Kg	EPA 8270			09/30	MTT
	Dibenzofuran	2.20	U	mg/Kg	EPA 8270			09/30	MTT
	2,4-Dinitrotoluene	2.20	U	mg/Kg	EPA 8270			09/30	MTT
	Diethylphthalate	2.20	U	mg/Kg	EPA 8270			09/30	MTT
	4-Chlorophenyl-Phenylet	2.20	Ü	mg/Kg	EPA 8270			09/30	MTT
	Fluorene	2.20	Ü	mg/Kg	EPA 8270			09/30	MTT
	4-Nitroaniline	2.20	U	mg/Kg	EPA 8270			09/30	MTT
	4,6-Dinitro-2-Methylphe	2.20	U	mg/Kg	EPA 8270			09/30	MTT
	n-Nitrosodiphenylamine	2.20	U	mg/Kg	EPA 8270			09/30	MTT
	4-Bromophenyl-Phenyleth	2.20	U	mg/Kg	EPA 8270			09/30	MTT
	Hexachlorobenzene	2.20	U	mg/Kg	EPA 8270			09/30	MTT
	Pentachlorophenol	2.20	U	mg/Kg	EPA 8270			09/30	MTT
	Phenanthrene	2.20	U	mg/Kg	EPA 8270			09/30	MTT
	Anthracene	2.20	U	mg/Kg	EPA 8270			09/30	MTT
	di-n-Butylphthalate	2.20	U	mg/Kg	EPA 8270			09/30	MTT
•••	Fluoranthene	2.20	Ü	mg/Kg	EPA 8270			09/30	MTT
	Pyrene	2.20		mg/Kg	EPA 8270			09/30	MTT
J	Butylbenzylphthalate	2.20	Ü	mg/Kg	EPA 8270			09/30	MTT
	3,3-Dichlorobenzidine	2.20	U	mg/Kg	EPA 8270			09/30	MTT
	Benzo(a)Anthracene	2.20	Ü	mg/Kg	EPA 8270			09/30	MTT
	Chrysene	2.20	U	mg/Kg	EPA 8270			09/30	MTT
	bis(2-Ethylhexyl)Phthal	2.20	Ü	mg/Kg	EPA 8270			09/30	MTT
	di-n-Octylphthalate	2.20	Ü	mg/Kg	EPA 8270			09/30	MTT
	Benzo(b)Fluoranthene	2.20	Ü	mg/Kg	EPA 8270			09/30	MTT
	Benzo(k)Fluoranthene	2.20	U	mg/Kg	EPA 8270			09/30	MTT
	Benzo(a)Pyrene	2.20	U U	mg/Kg	EPA 8270			09/30 09/30	MTT
	Indeno(1,2,3-cd)Pyrene	2.20	บ	mg/Kg	EPA 8270 EPA 8270			09/30	MTT
	Dibenz(a,h)Anthracene	2.20	Ü	mg/Kg mg/Kg	EPA 8270			09/30	MTT
	Benzo(g,h,i)Perylene	2.20	u	mg/ Kg	EFR 0270		03/00	0 3 / 3 0	1111
	Sample Preparation				EPA 3050 Digest				
	•				•				
	Total Metals Analysis					n/a			
	ICP Screen, ICF	2300		na ///a	EPA EPA 6010	n/a	09/21	09/02	DFL
	Aluminum	63	บ -	mg/KgJ.3	EPA 6010 EPA 6010			09/02	DFL
	Antimony	63	Ü	mg/Kg	EPA 6010			09/02	DFL
	Arsenic	290	U	mg/Kg	EPA 6010 EPA 6010			09/02	DFL
	Barium Beryllium	32	U	mg/Kg	EPA 6010			09/02	DFL
	Cadmium	32		mg/Kg	EPA 6010 EPA 6010			09/02	DFL
	Calcium	2000	J	mg/Kg	EPA 6010			09/02	DFL
	Chromium	2000		mg/Kg	EPA 6010 EPA 6010			09/02	DFL
	Cobalt	6.3	U	mg/Kg	EPA 6010			09/02	DFL
	Copper	32		mg/Kg	EPA 6010			09/02	DFL
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ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908			REF	ORT of ANALY	YSIS 4	Na			
Chemlab Ref.# Client Sample ID Matrix	:93.4354-4 :LAY-SS06-S03 :SOIL	POINT	~	<u> </u>			ANC	5633 B ST HORAGE, AK ! TEL: (907) 562 FAX: (907) 561	99518 2-2343
Iron		14000		mg/Kg	EPA	6010	08/31	09/02	DFL
Lead		92		mg/Kg	EPA	6010	08/31	09/02	DFL
Magnesium		1300		mg/Kg	EPA	6010	08/31	09/02	DFL
Manganese		160		J mg/Kg J.3	EPA	6010	08/31	09/02	DFL
Molybdenum		32	U	mg/Kg	EPA	6010	08/31	09/02	DFL
Nickel		16		mg/Kg	EPA	6010	08/31	09/02	DFL
Potassium		430		St mg/Kg	EPA	6010	08/31	09/06	DLG
Selenium		63	U	Img/Kg IX3 '	EPA	6010	08/3:	09/02	DFL
Silver		32	U	Rmg/Kg S.I	EPA	6010	08/3:	09/02	DFL
Sodium		250		mg/Kg	EPA	6010	08/3:	09/06	DLG
Thallium		0.31	U	mg/Kg	EPA	7841	08/30	09/01	KAW
Vanadium		13		mg/Kg	EPA	6010	08/3:	09/02	DFL
Zinc		85		mg/Kg	EPA	6010	08/3:	L 09/02	DFL

All charges 1.2 2/3/94

D = Secondary dilution.

UA = Unavailable NA = Not Analyze LT = Less Than

GT = Greater Than



See Special Instructions Above

See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.



REPORT of ANALYSIS

ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.# :93.4354-5

Client Sample ID :LAY-SS06-S08 POINT LAY

Matrix

:SOIL

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

Client Name Ordered By

:ICF KAISER ENGINEERING

Project#

:RAY MORRIS Project Name : DEW LINE RI/FS :41096-412-01

PWSID

:UA

WORK Order

:70106

Report Completed :10/07/93

Collected Received

:08/24/93 @ 15:05 hrs

:08/26/93 @ 12:00 hrs

Released By : STEPHEN C. EDE

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C.

Parameter	QC Results Qua		Method	Allowable Limits	Ext. Date	Anal Date	In it
Volatile Organics			EPA 8260				
Benzene	0.100 ប	mg/Ka	EPA 8260				
Bromopenzene	0.100 U	mg/Kg	EPA 8260			09/13	KWM
Bromochloromethane	0 .100 ü	mg/Kg	EPA 8260			09/13	KWM
Bromodichloromethane	0.100 ប	mg/Kg	EPA 8260			09/13	KWM
Bromoform	0.100 U	mg/Kg	EPA 8260		08/26		KWM
Bromomethane	0.100 U	mg/Kg	EPA 8260		08/26		KWH
n-Butylbenzene	0.100 ប	mg/Kg	EPA 8260		08/26		KWM
sec-Butylbenzene	0.100 ប	mg/Kg	EPA 8260		08/26		KWM
tert-Butylbenzne	0.100 ប	mg/Kg	EPA 8260		08/26		KWM
Carbon Tetrachloride	0.100 = U	mg/Kg	EPA 8260		08/26		KWM
Chlorobenzene	0-100 U	mg/Kg	EPA 8260		08/26		KWM
Chloroethane	0.100 U	mg/Kg	EPA 8260		08/26		KWM
Chloroform	0.100 U	mg/Kg	EPA 8260		08/26		KWH
Chloromethane	0.100 U	mg/Kg	EPA 8260		08/26		KWM
2-Chlorotoluene	0.100 U	m g/K g			08/26		KWM
4-Chlorotoluene	0.100 U	mg/Kg	EPA 8260		08/26		KWM
Dibromochloromethane	0.100 U	mg/Kg	EPA 8260		08/26		KWM
12Dibromo3Chloropropane	0.100 IJ	mg/Kg	EPA 8260		08/26		KWM
1,2-Dibromoethane	0.100 U	mg/Kg	EPA 8260		08/26		KWM
Dibromomethane	0.100 U	mg/Kg	EPA 8260		08/26		KWM
1,2-Dichlorobenzene	0.100 U	mg∕Kg	EPA 8260		08/26		KWM
1,3-Dichlorobenzene	0.100 Ü	mg∕Kq	EPA 8260		08/26		KWM
1,4-Dichlorobenzene	0.100 U	mg/Kg	EPA 8260		08/26		KWM
Dichlorodifluoromethane	0.100 U	mg/Kg	EPA 8260		08/26		KWM
1,1-Dichloroethane	0.100 U	mg/Kg	EPA 8260		08/26		KWM
1,2-Dichloroethane	0.100 U	mg/Kg	EPA 8260		08/26		KWM
1,1-Dichloroethene	0.100 U	mg/Kg	EPA 8260		08/26		KWM
cis-1,2-Dichloroethene	0.100 U	mg/Kg	EPA 8260		08/26		KWM
trans1,2-Dichloroethene	0.100 U	mg/Kg	EPA 8260		08/26		KWM
1,2-Dichloropropane	0.100 U	mg/Kg	EPA 8260		08/26		KWM
1,3-Dichloropropane	0.100 U	mg/Kg	EPA 8260		08/26		KWM
2,2-Dichloropropane	0.100 U	mg/Kg	EPA 8260		08/26		KWM
1,1-Dichloropropene	0.100 U	mg/Kg	EPA 8260		08/26		KWM -
Ethylbenzene	0.100 U	mg/Kg	EPA 8260		08/26		KWM
Hexachlorobutadiene	0.100 U	mg/Kg	EPA 8260		08/26		KWM
Isopropylbenzene	0.100 U	mg/Kg	EPA 8260		08/26		KWM
p-Isopropyltoluene	0.100 U	mg/Kg	EPA 8260		08/26		KWM
	3. 200	9/ Kg	EPA 8260		08/26	09/13	KWM



ENVIRONMENTAL LABORATORY SERVICES

Chambala D. C. H	REF	PORT of AN	ALYSIS &C		
Chemlab Ref.# :93.4354-5				56 33 B S ANCHORAGE, AK	TREET
Client Sample ID :LAY-SS06-S08	B POINT LA	·Υ		TEL: (907) 56	
Matrix :SOIL				FAX: (907) 56	
Methylene Chloride	0 100				
Napthalene	0.100 U	mg/Kg	EPA 8260	08/26 09/13	KWM
n-Propylbenzene	0.100 U	m g/K g	EPA 8260	08/26 09/13	KWM
Styrene	0.100 U	m g/K g	EPA 8260	08/26 09/13	KWM
1112-Tetrachloroethane	0.100 U	m g∕K g	EPA 8260	08/26 09/13	KWM
1122-Tetrachloroethane	0.100 U	m g/K g	EPA 8260	08/26 09/13	KWM
Tetrachloroethene	0.100 U	m g∕K g	EPA 8260	08/26 09/13	KWM
Toluene	0.100 U	m g/K g	EPA 8260	08/26 09/13	KWM
	0.100 U	m g∕K g	EPA 8260	08/26 09/13	KWM
1,2,3-Trichlorobenzene	0.100 U	m g/K g	EPA 8260	08/26 09/13	KWM
1,2,4-Trichlorobenzene	0.100 U	m g/K g	EPA 8260	08/26 09/13	KWM
1,1,1-Trichloroethane	0.100 ប	mg/Kg	EPA 8260	08/26 09/13	KWM
1,1,2-Trichloroethane	0 .100 U	mg/Kg	EPA 8260	08/26 09/13	KWM
Trichloroethene	0.100 U	mg/Kg	EPA 8260		
Trichlorofluoromethane	0.100 U	mg/Kg	EPA 8260	08/26 09/13	KWM
1,2,3-Trichloropropane	0.100 U	mg∕Kg		08/26 09/13	KWM
1,2,4-Trimethylbenzene	0.100 U		EPA 8260	08/26 09/13	KWM
1,3,5-Trimethylbenzene	0.100 U	mg/Kg	EPA 8260	08/26 09/13	KWM
Vinyl Chloride	0.100 U	mg/Kg	EPA 8260	08/26 09/13	KWM
p+m-Xylene		mg/Kg	EPA 8260	08/26 09/13	KWM
o-Xylene	0.100 U 0.100 U	mg/Kg	EPA 8260	08/26 09/13	KWM
•	0.100	mg/Kg	EPA 8260	08/26 09/13	KWM
Semivolatile Organics			ED1 0270		
Phenol	2 .20 U	ma /Va	EPA 8270		
bis(2-Chloroethyl)ether	2.20 · U	mg/Kg	EPA 8270	09/06 09/30	T
2-Chlorophenol	2.20 U	mg/Kg	EPA 8270	09/06 09/30	
1,3-Dichlorobenzene		mg/Kg	EPA 8270	09/06 09/30	MTT
1,4-Dichlorobenzene		mg/Kg	EPA 8270	0 9/ 06 09/ 30	MTT
Benzyl Alcohol		m g∕ Kg	EPA 8270	09/06 09/30	MTT
1,2-Dichlorobenzene	2.20 U	mg/Kg	EPA 8270	09/06 09/30	MTT
2-Methylphenol	2.20 U	mg/Kg	EPA 8270	09/06 09/30	MTT
bis(2-Chloroisopropyl)e	2.20 U	mg/Kg	EPA 8270	09/06 09/30	MTT
4-Methylphenol	2.20 U	m g/K g	EPA 8270	09/06 09/30	MTT
n-Nitroso-di-n-Propylam	2.20 U	m g/K g	EPA 8270	09/06 09/3 0	MTT
Hexachloroethane	2.20 U	m g/K g	EPA 8270	09/06 09/30	MTT
Nitrobenzene	2.20 U	m g/K g	EPA 8270	09/06 09/30	MTT
Isophorone	2.20 U	m g/K g	EPA 8270	09/06 09/30	MTT
2-Nitrophenol	2.20 U	m g/K g	EPA 8270	09/06 09/30	MTT
2 4 Dinothylphonal	2 .20 U	mg/Kg	EPA 8270	09/06 09/30	HTT
2,4-Dimethylphenol	2 .20 ប	mg/Kg	EPA 8270	09/06 09/30	MTT
Benzoic Acid	2 .20 U	mg/Kg	EPA 8270	09/06 09/30	MTT
bis(2-Chloroethoxy)Meth	2 .20 U	mg/Kg	EPA 8270	09/06 09/30	MIT
2,4-Dichlorophenol	2 .20 U	mg/Kg	EPA 8270	09/06 09/30	MTT
1,2,4-Trichlorobenzene	2.20 U	m g/K g	EPA 8270	09/06 09/30	MTT
Naphthalene	2 .20 ប	mg/Kg	EPA 8270	09/06 09/30	MTT
4-Chloroaniline	2.20 U	mg/Kg	EPA 8270	09/06 09/30	MIT
Hexachlorobutadiene	2 .20 U	mg/Kg	EPA 8270	09/06 09/30	MTT
4-Chloro-3-Methylphenol	2.20 U	mg/Kg	EPA 8270	09/06 09/30	MTT
2-Methylnaphthalene	2 .20 U	mg/Kg	EPA 8270	09/06 09/30	MTT
Hexachlorocyclopentadie	2.20 U	mg/Kg	EPA 8270	09/06 09/30	MTT
2,4,6-Trichlorophenol	2 .20 U	mg/Kg	EPA 8270	09/06 09/30	MTT
2,4,5-Trichlorophenol	2.20 U	mg/Kg	EPA 8270	09/06 09/30	MIT
2-Chloronaphthalene	2.20 U	mg/Kg	EPA 8270	09/06 09/30	
		J 3	52.0	03,00 03,30	
					-

ENVIRONMENTAL LABORATORY SERVICES

Chamilah Bas # Car	REPORT of ANALYSIS	/
Chemiab Ref.# :93.4354-5 Client Sample ID :LAY-SS06-S08 Matrix :SOIL	POINT LAY	5633 8 STREET ANCHORAGE. AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301
2-Nitroaniline	2 20 11	FAX: (907) 561-5301
Dimethylphthalate	2.20 U mg/Kg EPA 8270 2.20 U mg/Kg FPA 8270	09/06 09/30 MTI
Acenaphthylene	2 2	09/06 09/30 MTT
2,6-Dinitrotoluene	2 22	09/06 09/30 MTT
3-Nitroaniline	3,019	09/06 09/30 MTT
Acenaphthene		09/06 09/30 MTT
2,4-Dinitrophenol	2 20	09/06 09/30 MTT
4-Nitrophenol		09/06 09/30 MTT
Dibenzofuran		09/06 09/30 MTT
2,4-Dinitrotoluene	2 02 III III III III III III III III III	09/06 09/30 MTT
Diethylphthalate		09/06 09/30 MTT
4-Chlorophenyl-Phenylet		09/06 09/30 MTT
Fluorene		09/06 09/30 MTT
4-Nitroaniline	2 22	09/06 09/30 MTT
4,6-Dinitro-2-Methylphe	2 A U2/U	09/06 09/30 MTT
n-Nitrosodiphenylamine		09/06 09/30 MTT
4-Bromophenyl-Phenyleth	2.20 U mg/Kg EPA 8270 2.20 U mg/Kg EPA 8270	09/06 09/30 MTT
Hexachlorobenzene	2.20 U mg/Kg EPA 8270	09/06 09/30 MTT
Pentachlorophenol	2.20 U mg/Kg EPA 8270	09/06 09/30 MTT
Phenanthrene	2.20 U mg/Kg EPA 8270	09/06 09/30 MTT
Anthracene	2.20 U mg/Kg EPA 8270	09/06 09/30 MTT
di-n-Butylphthalate	2.20 U mg/Kg EPA 8270	09/06 09/30 MTT
Fluoranthene	2.20 U mg/Kg EPA 8270	09/06 09/30 MTT
Pyrene	2.20 U mg/Kg EPA 8270	09/06 09/30 MTT
Butylbenzylphthalate	2.20 U mg/Kg EPA 8270	09/06 09/30 MTT
3,3-Dichloropenzidine	2.20 U mg/Kg EPA 8270	09/06 09/30 MTT
Benzo(a)Anthracene	2.20 U mg/Kg EPA 8270	09/06 09/30 MTT
Chrysene	2.20 U mg/Kg EPA 8270	09/06 09/30 MTT
bis(2-Ethylhexyl)Phthal	2.20 U mg/Kg EPA 8270	09/06 09/30 MTT
di-n-Octylphthalate	2.20 U mg/Kg EPA 8270	09/06 09/30 MTT
Benzo(b)Fluoranthene	2.20 U mg/Kg EPA 8270	09/06 09/30 MTT
Benzo(k)Fluoranthene	2.20 U mg/Kg EPA 8270	09/06 09/30 MTT
Benzo(a)Pyrene	2.20 U mg/Kg EPA 8270	09/06 09/30 MTT
Indeno(1,2,3-cd)Pyrene	2.20 U mg/Kg EPA 8270	09/06 09/30 MTT
Dibenz(a,h)Anthracene	2.20 U mg/Kg EPA 8270	09/06 09/30 MTT 09/06 09/30 MTT
Benzo(g,h,i)Perylene	2.20 U mg/Kg EPA 8270	09/06 09/30 MTT 09/06 09/30 MTT
Sample Preparation		03/08 03/30 MII
ommpre Freparation	EPA 3050 Dige	est
Total Metals Analysis	5	
ICP Screen, ICF		
Aluminum	EPA	n/a
Antimony	2100 mg/Kg EPA 6010	08/31 09/02 DFL
Arsenic	50 U mg/Kg EPA 6010	08/31 09/02 DFL
Barium	50 U mg/Kg EPA 6010	08/31 09/02 DFL
Beryllium	280 mg/Kg EPA 6010	08/31 09/02 DFL
Cadmium	25 U mg/Kg EPA 6010	08/31 09/02 DFL
Calaina	25 U mg/Kg EPA 6010	08/31 09/02 DFL
Chromium	.500 mg/Kg EPA 6010	08/31 09/02 DFL
Cobalt	54 mg/Kg EPA 6010	08/31 09/02 DFL
Copper	5.0 U mg/Kg EPA 6010 25 U mg/Kg FPA 6010	08/31 09/02 DFL
	25 U mg/Kg EPA 6010	08/31 09/02 DFL





ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS SEC Chemlab Ref.# :93.4354-5 5633 B STREET Client Sample ID :LAY-SS06-S08 POINT LAY ANCHORAGE, AK 99518 TEL: (907) 562-2343 Matrix FAX: (907) 561-5301 Iron 20000 mg/Kg EPA 6010 08/31 09/02 DFL Lead 195 mq/Kq EPA 6010 08/31 09/02 DFL Magnesium 1200 mg/Kg EPA 6010 08/31 09/02 DFL Manganese 270 mg/Kg EPA 6010 08/31 09/02 DFL Molybdenum 25 U mg/Kg EPA 6010 08/31 09/02 DFL Nickel 12 mg/Kg EPA 6010 08/31 09/02 DFL Potassium 410 mg/Kg EPA 6010 08/31 09/06 DLG Selenium 50 U mg/Kg EPA 6010 08/31 09/02 DFL Silver 25 U mg/Kg EPA 6010 08/31 09/02 DFL Sodium 81 mg/Kq EPA 6010 08/31 09/06 DLG Thallium 0.27 U mg/Kg EPA 7841 08/30 09/01 KAW Vanadium 12 mg/Kg EPA 6010 08/31 09/02 DFL Zinc 59

mg/Kg

EPA 6010

See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit. D = Secondary dilution.

UA = Unavailable NA = Not Analyzed

08/31 09/02

DFL

LT = Less Than

GT = Greater Than



See Special Instructions Above



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4693-14 Client Sample ID :LAY-SS06-2S12

Matrix

:SOIL

:70764 WORK Order

Report Completed :11/09/93

Collected :09/07/93 @ 15:20 hrs :09/09/93 @ 12:00 hrs Received

5633 B STREET

TEL: (907) 562-2343 FAX: (907) 561-5301

ANCHORAGE, AK 99518

Technical Director: STEPHEN C. EDE

Released By :

Client Name Ordered By

Project#

PWSID

Project Name

:SHERI K ACE :DEWLINE RI/FS :41096-412-01

:ICF KAISER ENGINEERING

:UA

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. 2500 MG/KG OF EPH PATTERN IS NOT

CONSISTENT WITH MIDDLE DISTILLATE FUEL. B = THIS FLAG IS USED WHEN THE ANALYTE IS FOUND IN THE ASSOCIATED BLANK AS WELL AS IN THE SAMPLE. Qualifier / Comments

					Chic	my of			
	Parameter	D1+-	QC	11 - 14 -	W-44-3	#llowable	Ext.	Anal	7-3 -
		Results	Quar	Units	Method	Limits	Date	Date	Init
	Percent Solids	88.2		<u>-</u>	SM17 2540G	. 1/ 1		09/10	·EAL
	Hydrocarbons EPH	2900	D	mg/Kg	SM17 2540G 3510/3550/8100t	1(2)-K·1	09/14	09/21	JBH
	Hydrocarbons VPH	172		mg/Kg	EPA 5030/8015M	•		09/18	WLS
		1,2		9/1/9	E: 11 50507 00151.		03, 10	03, 10	,,,,,,
	Volatile Organics				EPA 8260	_			
	Benzene	2.00	U	mg/Kg	EPA 8260(J)	-A.1	09/10	10/01	KWM
	Bromobenzene	2.00	Ü	mg/Kg	EPA 8260 ,		09/10	10/01	KWM
	Bromochloromethane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
	Bromodichloromethane	2.00	Ü	mg/Kg	EPA 8260		09/10	10/01	KWM
•	Bromoform	2.00	U	mg/Kg	EPA 8260 \		09/10	10/01	KWM
	Bromomethane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
	n-Butylbenzene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
	sec-Butylbenzene	2.00		mg/Kg	EPA 8260		09/10	10/01	KWM
	tert-Butylbenzne	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
	Carbon Tetrachloride	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
	Chlorobenzene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
	Chloroethane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
	Chloroform	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
	Chloromethane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWH
	2-Chlorotoluene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
	4-Chlorotoluene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
	Dibromochloromethane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
	12Dibromo3Chloropropane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
	1,2-Dibromoethane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
	Dibromomethane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
	1,2-Dichlorobenzene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
	1,3-Dichlorobenzene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
	1,4-Dichlorobenzene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
	Dichlorodifluoromethane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
	1,1-Dichloroethane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
	1,2-Dichloroethane	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
	1,1-Dichloroethene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
	cis-1,2-Dichloroethene	2.00	U	mg/Kg	EPA 8260			10/01	KWM
	trans1,2-Dichloroethene	2.00	U	mg/Kg	EPA 8260		09/10	10/01	KWM
	1,2-Dichloropropane	2.00	U	mg/Kg	EPA 8260 /			10/01	KWM
_	1,3-Dichloropropane	2.00	U	mg/Kg	EPA 8260 🎔		09/10	10/01	KWM
_					•				

Compiled: SMF 11/29/44



SGS Member of the SGS Group (Société Générale de Surveillance)



COMMERCIAL TESTING & ENGINEERING CO. ENVIRONMENTAL LABORATORY SERVICES

S-NGE 1908	REPORT of ANALYSIS	5833 B ST
Chemlab Ref.# :93.4693-14		ANCHORAGE, AK 95575
Client Sample ID :LAY-SS06-2S12	/\ 11	TEL: (907) 562-2343 FAX: (907) 561-5301
Matrix :SOIL	(Yueld	Ul / Comment - (301) 301-3301
	- Was 1/1	1
2,2-Dichloropropane .	2.00 U mg/Kg EPA 8260(J)-A	./ 09/10 10/01 KWM
1,1-Dichloropropene	2.00 U mg/Kg EPA 8260,	09/10 10/01 KWM
Ethylbenzene	2.00 U mg/Kg EPA 8260	09/10 10/01 KWM
Hexachlorobutadiene	2.00 U mg/Kg EPA 8260	09/10 10/01 KWM
Isopropylbenzene	2.00 U mg/Kg EPA 8260	09/10 10/01 KWM
p-Isopropyltoluene -	2.00 U mg/Kg EPA 8260	09/10 10/01 KWM
Methylene Chloride	2.00 U mg/Kg EPA 8260	09/10 10/01 KWM 09/10 10/01 KWM
Napthalene	2.00 U mg/Kg EPA 8260	
n-Propylbenzene	2.00 U mg/Kg EPA 8260	09/10 10/01 KWM 09/10 10/01 KWM
Styrene	2.00 U mg/Kg EPA 8260	09/10 10/01 KWM
1112-Tetrachloroethane	2.00 U mg/Kg EPA 8260	09/10 10/01 KWM
1122-Tetrachloroethane	2.00 U mg/Kg EPA 8260	09/10 10/01 KWM
Tetrachloroethene	2.00 U mg/Kg EPA 8260	09/10 10/01 KWM
Toluene	2.00 U mg/Kg EPA 8260	09/10 10/01 KWM
1,2,3-Trichlorobenzene	2.00 U mg/Kg EPA 8260 2.00 U mg/Kg EPA 8260	09/10 10/01 KWM
1,2,4-Trichlorobenzene		09/10 10/01 KWM
1,1,1-Trichloroethane		09/10 10/01 KWM
1,1,2-Trichloroethane	2.00 U mg/Kg EPA 8260 2.00 U mg/Kg EPA 8260	09/10 10/01 KWM
Trichloroethene Trichlorofluoromethane	2.00 U mg/Kg EPA 8260	09/10 10/01 KWM
1,2,3-Trichloropropane	2.00 U mg/Kg EPA 8260	09/10 10/01 KWM
1,2,4-Trimethylbenzene	2.00 U mg/Kg EPA 8260	09/10 10/01 KWM
1,3,5-Trimethylbenzene	2.00 U mg/Kg EPA 8260	09/10 10/01KWM
Vinyl Chloride	2.00 U mg/Kg EPA 8260	09/10 10/01 NM
p+m-Xylene	2.00 U mg/Kg EPA 8260	09/10 10/01 HM
o-Xylene	2.00 U mg/Kg EPA 8260 →	09/10 10/01 KWM
-		
Semivolatile Organics	EPA 8270	09/17 10/26 GV
Phenol	2.25 U mg/Kg EPA 8270	,
bis(2-Chloroethyl)ether	2.25 U mg/Kg EPA 8270	09/17 10/26 GV 09/17 10/26 GV
2-Chlorophenol	2.25 U mg/Kg EPA 8270	09/17 10/26 GV
1,3-Dichlorobenzene	2.25 U mg/Kg EPA 8270 2.25 U mg/Kg EPA 8270	09/17 10/26 GV
1,4-Dichlorobenzene		09/17 10/26 GV
Benzyl Alcohol	2.25 U mg/kg EPA 8270 2.25 U mg/kg EPA 8270	09/17 10/26 GV
1,2-Dichlorobenzene	2.25 U mg/Kg EPA 8270	09/17 10/26 GV
<pre>2-Methylphenol bis(2-Chloroisopropyl)e</pre>	2.25 U mg/Kg EPA 8270	09/17 10/26 GV
4-Methylphenol	2.25 U mg/Kg EPA 8270	09/17 10/26 GV
n-Nitroso-di-n-Propylam	2.25 U mg/Kg EPA 8270	09/17 10/26 GV
Hexachloroethane	2.25 U mg/Kg EPA 8270	09/17 10/26 GV
Nitrobenzene	2.25 U mg/Kg EPA 8270	09/17 10/26 - GV
Isophorone	2.25 U mg/Kg EPA 8270	09/17 10/26 GV
2-Nitrophenol	2.25 U mg/Kg EPA 8270	09/17 10/26 GV
2,4-Dimethylphenol	2.25 U mg/Kg EPA 8270	09/17 10/26 GV 09/17 10/26 GV
Benzoic Acid	2.25 U mg/Kg EPA 8270 (7)-	09/17 10/26 GV 09/17 10/26 GV
bis(2-Chloroethoxy)Meth	2.25 U mg/Kg EPA 8270	09/17 10/26 GV 09/17 10/26 GV
2,4-Dichlorophenol	2.25 U mg/Kg EPA 8270	09/17 10/26 GV
1,2,4-Trichlorobenzene	2.25 U mg/Kg EPA 8270 2.25 U mg/Kg EPA 8270	09/17 10/26 GV
Naphthalene		- 1 m 09/17 10/26 GV
4-Chloroaniline	_ ·	19/17 10/26 _ GV
Hexachlorobutadiene	2.25 U mg/Kg EPA 8270	8 -1 - 4 m
	(96) all	(the contraction of the contract
	2.2.77	Compilia
•	2 •	11/ralast
65 6	Mambar et the CCC Crown (Société Générale de Su	W/II
, , , , , , , , , , , , , , , , , , ,	. The transfer of the CCC Croup (Specials (Specials de Sill	1 Control of 16 160 1



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS 5633 B STREET Chemlab Ref.# :93.4693-14 ANCHORAGE, AK 99518 Qualycer / Usimuts TEL: (907) 562-2343 Client Sample ID :LAY-SS06-2S12 FAX: (907) 561-5301 Matrix :SOIL 09/17 10/26 4-Chloro-3-Methylphenol 2.25 ma/Ka EPA 8270 09/17 10/26 2.25 2-Methylnaphthalene U ma/Ka EPA 8270 09/17 10/26 EPA 8270 Hexachlorocyclopentadie 2.25 U mg/Kg

GV GV GV 09/17 10/26 GV 2.25 EPA 8270 2,4,6-Trichlorophenol u mg/Kg 09/17 10/26 GV EPA 8270 2.25 2,4,5-Trichlorophenol U mg/Kg 09/17 10/26 GV EPA 8270 2.25 2-Chloronaphthalene U mq/Kq 09/17 10/26 GV EPA 8270 2.25 2-Nitroaniline U mg/Kg 09/17 10/26 GV EPA 8270 Dimethylphthalate 2.25 U mq/Kq GV 09/17 10/26 2.25 U EPA 8270 Acenaphthylene ma/Ka 09/17 10/26 GV 2.25 U EPA 8270 2.6-Dinitrotoluene mq/Kq 09/17 10/26 GV 2.25 U EPA 8270 3-Nitroaniline mg/Kg 09/17 10/26 2.25 GV Acenaphthene U EPA 8270 mg/Kg 09/17 10/26 GV EPA 8270 2,4-Dinitrophenol 2.25 U mg/Kg EPA 8270 09/17 10/26 GV 2.25 U 4-Nitrophenol mg/Kg 09/17 10/26 GV EPA 8270 2.25 U Dibenzofuran mg/Kg 09/17 10/26 GV EPA 8270 2,4-Dinitrotoluene 2.25 U mg/Kg 09/17 10/26 **GV** Diethylphthalate 2.25 U EPA 8270 mg/Kg 09/17 10/26 2.25 GV 4-Chlorophenyl-Phenylet U EPA 8270 mg/Kg 09/17 10/26 GV 2.25 U EPA 8270 Fluorene mg/Kg 09/17 10/26 GV 4-Nitroaniline 2.25 U mg/Kg EPA 8270 09/17 10/26 GV 4,6-Dinitro-2-Methylphe 2.25 U mg/Kg EPA 8270 09/17 10/26 GV n-Nitrosodiphenylamine 2.25 U EPA 8270 mg/Kg 09/17 10/26 GV 4-Bromophenyl-Phenyleth 2.25 U mg/Kg EPA 8270 EPA 8270(J).D.1 09/17 10/26 GV Hexachlorobenzene 2.25 U mg/Kg EPA 8270(T)-D.1 09/17 10/26 **GV** Pentachlorophenol 2.25 U mg/Kg 2.25 U EPA 8270 09/17 10/26 **GV** Phenanthrene mg/Kg 09/17 10/26 2.25 U mg/Kg EPA 8270 GV Anthracene EPA 8270 (4) -E.1, F.2 09/17 10/26 B **GV** di-n-Butylphthalate 2.79 mg/Kg 09/17 10/26 2.25 **GV** EPA 8270 Fluoranthene U mq/Kq 09/17 10/26 **GV** EPA 8270 2.25 Pyrene Ü ma/Ka 09/17 10/26 GV EPA 8270 Butylbenzylphthalate 2.25 U mq/Kq 09/17 10/26 GV 3.3-Dichlorobenzidine 2.25 U EPA 8270 mq/Kq 09/17 10/26 GV Benzo(a)Anthracene 2.25 U EPA 8270 ma/Ka 09/17 10/26 **GV** 2.25 U EPA 8270 Chrysene mg/Kg 09/17 10/26 G**V** bis(2-Ethylhexyl)Phthal 2.25 Ü mg/Kg EPA 8270 09/17 10/26 GV 2.25 U EPA 8270 di-n-Octylphthalate mq/Kq 09/17 10/26 GV EPA 8270 Benzo(b)Fluoranthene 2.25 H mg/Kg 09/17 10/26 GV EPA 8270 Benzo(k)Fluoranthene 2.25 Ħ mg/Kg EPA 8270 09/17 10/26 **GV** Benzo(a)Pyrene 2.25 U mg/Kg 09/17 10/26 Indeno(1,2,3-cd)Pyrene U EPA 8270 **GV** 2.25 mg/Kg EPA 8270(J) -D.1 Dibenz(a,h)Anthracene 2.25 U 09/17 10/26 - GV mg/Kg EPA 8270(5) -D. 1 09/17 10/26 GV Benzo(g,h,i)Perylene 2.25 11 mg/Kg

See Special Instructions Above

See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed

LT = Less Than

GT = Greater Than



SGS Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.#

:93.4693-15

Client Sample ID :LAY-SS06-2S13

Matrix

PWSID

:SOIL

REPORT of ANALYSIS

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343

FAX: (907) 561-5301

Client Name

:ICF KAISER ENGINEERING

:SHERI K ACE

Ordered By Project Name Project#

:DEWLINE RI/FS :41096-412-01

:UA

WORK Order

Received

:70764

Report Completed :11/09/93 Collected

:09/07/93 @ 15:13 hrs

:09/09/93 @ 12:00 hrs

Technical Director: STEPHEN C. EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. EPH PATTERN IS NOT CONSISTENT

WITH MIDDLE DISTILLATE FUEL.

Parameter	Results	QC Qual Units	Method	Allowable Limits	Ext. Date	Anal Date	In it
Percent Solids Hydrocarbons EPH	82.2 18.5	ع mg/Kg	SM17 2540G 3510/3550/8100M		09/14	09/10 09/21	EAL JBH
VPH & BTEX Hydrocarbons VPH	1.41	mg/Kg	EPA 8015M/8020 EPA 5030/8015m		09/10	09/17	WLS
Benzene Toluene Ethylbenzene p&m Xylene o-Xylene	0.025 0.025 0.025 0.025 0.025	U mg/Kg U mg/Kg U mg/Kg U mg/Kg	EPA 8020 EPA 8020 EPA 8020 EPA 8020 EPA 8020		09/10 09/10 09/10 09/10 09/10	09/17 09/17 09/17	WLS WLS WLS

* See Special Instructions Above

** See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit. D = Secondary dilution.

NA = Not Analyzed LT = Less Than GT = Greater Than

UA = Unavailable





ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.#

:93.4693-16

Matrix

Client Sample ID :LAY-SS06-2S14

:SOIL

5633 B STREET ANCHORAGE, AK 99513 TEL: (907) 562-2343

FAX: (907) 551-5301

Client Name

:ICF KAISER ENGINEERING

Ordered By Project Name Project#

:SHERI K ACE :DEWLINE RI/FS :41096-412-01

PWSID

:UA

WORK Order

:70764

Report Completed Collected

:11/09/93

:09/07/93 @ 15:30 hrs

Received Technical Director: STEPHEN, C. EDE

:09/09/93 @ 12:00 hrs

Released By : /

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. 55.8 MG/KG OF EPH PATTERN IS NOT

CONSISTENT WITH MIDDLE DISTILLATE FUEL.

	Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
	Percent Solids Hydrocarbons EPH	95.8 220		% mg/Kg	SM17 2540G 3510/3550/8100M		09/14	09/10 09/21	EAL JBH
	VPH & BTEX Hydrocarbons VPH	1.28		mg/Kg	EPA 8015M/8020 EPA 5030/8015m		09/10	09/17	WLS
•	Benzene Toluene Ethylbenzene p&m Xylene o-Xylene	0.020 0.020 0.020 0.031 0.020	U U	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	EPA 8020 EPA 8020 EPA 8020 EPA 8020 EPA 8020		09/10 09/10 09/10	09/17 09/17 09/17 09/17 09/17	WLS WLS WLS WLS

See Special Instructions Above See Sample Remarks Above

= Undetected, Reported value is the practical quantification limit. $\mathfrak{I} = \mathsf{Secondary} \ \mathsf{dilution}$.

UA = Unavailable NA = Not Analyzed LT = Less Than

GT = Greater Than





ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# Client Sample ID :LAY-SS06-2S15

:93.4693-17

Matrix

:SOIL

5633 B STREET ANCHORAGE, AK 99513 TEL: (907) 562-2343 FAX: (907) 561-5301

Client Name

WORK Order

Ordered By

:ICF KAISER ENGINEERING :SHERI K ACE

Report Completed :11/09/93

:70764

Project Name

:DEWLINE RI/FS

Collected

:09/07/93 @ 15:40 hrs

Project# PWSID

:41096-412-01 :UA

Received

:09/09/93 @ 12:00 hrs

Technical Director: STEPHEN C. EDE Released By :

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. EPH PATTERN IS NOT CONSISTENT

WITH MIDDLE DISTILLATE FUEL.

Parameter	QC Results Qual	Units	Method ·	Allowable Limits	Ext. Date	A nal Date	Init
Percent Solids Hydrocarbons EPH	98.4 14.4	³s πg∕Kg	SM17 2540G 3510/3550/8100M		09/14	09/10 09/21	EAL JBH
VPH & BTEX Hydrocarbons VPH	0.607	mg/Kg	EPA 8015M/8020 EPA 5030/8015m		09/10	09/17	WLS
Benzene Toluene Ethylbenzene p&m Xylene o-Xylene	0.020 U 0.020 U 0.020 U 0.020 U	mg/Kg mg/Kg mg/Kg mg/Kg	EPA 8020 EPA 8020 EPA 8020 EPA 8020 EPA 8020		09/10 09/10 09/10 09/10 09/10	09/17 09/17 09/17	WLS S WLS WLS

See Special Instructions Above

** See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit. D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed LT = Less Than

GT = Greater Than



SSS Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.#

:93.4693-18

Client Sample ID :LAY-SS06-2S16

Matrix

:SOIL

REPORT of ANALYSIS

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343

FAX: (907) 561-5301

Client Name

:ICF KAISER ENGINEERING

Ordered By Project Name

:SHERI K ACE :DEWLINE RI/FS :41096-412-01

Project# PWSID

:UA

WORK Order

:70764

Report Completed :11/09/93 Collected

:09/07/93 @ 15:50 hrs

Received Technical Director: STEPHEN C. EDE

:09/09/93 @ 12:00 hrs

Released By :

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. 4630 MG/KG OF EPH PATTERN IS NOT

CONSISTENT WITH MIDDLE DISTILLATE FUEL.

	Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	A nal Date	Init
	Percent Solids Hydrocarbons EPH	50.4 9030	D	% mg/Kg	SM17 2540G 3510/3550/8100M		09/14	09/10 09/21	EAL JBH
	VPH & BTEX Hydrocarbons VPH	733	D	m g/K g	EPA 8015M/8020 EPA 5030/8015m		09/10	09/18	WLS
•	Benzene Toluene Ethylbenzene p&m Xylene o-Xylene	0.178 1.56 2.15 3.29 1.45	ם ם ם	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	EPA 8020 EPA 8020 EPA 8020 EPA 8020 EPA 8020		09/10 09/10 09/10 09/10 09/10	09/18 09/18 09/18	WLS WLS WLS WLS

See Special Instructions Above See Sample Remarks Above

= Undetected, Reported value is the practical quantification limit. D = Secondary dilution.

UA = Unavailable NA = Not Analyzed

LT = Less Than GT = Greater Than





ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.#

:93.4693-19

Client Sample ID :LAY-S506-2S18

Matrix

:SOIL

SS33 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-23-3

FAX: (907) 551-5301

Client Name

:ICF KAISER ENGINEERING

:SHERI K ACE

Ordered By Project Name

:DEWLINE RI/FS :41096-412-01

Project# PWSID

:UA

WORK Order

:70764

Report Completed Collected

:11/09/93

:09/07/93

@ 15:55 hrs

Received Technical Director: STEPHEN C. EDE

:09/09/93 @ 12:00 hrs

Released By :

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. 6530 MG/KG OF EPH PATXERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	A nal Date	Init
Percent Solids Hydrocarbons EPH	66.2 15200	2	% mg/Kg	SM17 2540G 3510/3550/8100M		09/14	09/10 09/21	EAL JBH
VPH & BTEX Hydrocarbons VPH	937	D	mg/Kg	EPA 8015M/8020 EPA 5030/8015m		09/10	09/18	#LS
Benzene Toluene Ethylbenzene p&m Xylene o-Xylene	0.156 0.856 2.57 2.58 1.16		mg/Kg mg/Kg mg/Kg mg/Kg	EPA 8020 EPA 8020 EPA 8020 EPA 8020 EPA 8020			09/21 09/21 09/21	WLS WLS WLS WLS

See Special Instructions Above

See Sample Remarks Above

U = Undetected. Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable:

NA = Not Analyzed

LT = Less Than

GT = Greater Than



SES Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

Chemiab Ref.=

:93.4693-11

Client Sample ID :LAY-SS06-2SD05

Matrix

REPORT of ANALYSIS

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 552-2343 FAX: (907) 551-5301

:SOIL

WORK Order

:70764

Client Name Ordered By Project Name

:ICF KAISER ENGINEERING :SHERI H ACE

Report Completed

:11/09/93

Project#

:DEWLINE RI/FS :41096-412-01

Collected

:09/07/93 @ 15:15 :09/09/93 @ 12:00

PWSID

:UA

Received

Technical Director: STEPHEN C. EDE
Released By:

hrs

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. EPH PATTERN IS NOT CONSISTENT

WITH MIDDLE DISTILLATE FUEL.

	Parameter	Q Re s ults Qu		Method	Allowable Limits	Ext. Date	Anal Date	Init
	Percent Solids Hydrocarbons EPH	11.7 10300 D		SM17 2540G 3510/3550/8100M			09/10 09/21	EAL JBH
	VPH & BTEX Hydrocarbons VPH	16.3	mg/Kg	EPA 8015M/8020 EPA 5030/8015m			09/18	WLS
•	Benzene Toluene Ethylbenzene p&m Xylene o-Xylene	0.500 U 0.500 U 0.500 U 0.500 U	mg/Kg mg/Kg mg/Kg mg/Kg	EPA 8020 EPA 8020 EPA 8020 EPA 8020 EPA 8020		09/10 09/10 09/10 09/10 09/10	09/18 09/18 09/18	WLS WLS WLS WLS

See Special Instructions Above See Sample Remarks Above

= Undetected, Reported value is the practical quantification limit. \overline{D} = Secondary dilution.

UA = Unavailable

NA = Not Analyzed LT = Less Than

GT = Greater Than





ENVIRONMENTAL LABORATORY SERVICES

:93.4693-12

Chemiab Ref.= Client Sample ID :LAY-SS06-2SD06

Matrix

:SOIL

REPORT of ANALYSIS

5633 B STREET ANCHORAGE, AK 99515 TEL: (907) 562-2343

FAX: (907) 551-5301

Client Name

Ordered By

:ICF KAISER ENGINEERING

:SHERI K ACE

Project Name Project#

:DEWLINE RI/FS :41096-412-01

PWSID

WORK Order

Collected Received

:70764 Report Completed :11/09/93

:09/07/93 @ 15:25 hrs

:09/07/93 @ 15:25 hrs :09/09/93 @ 12:00 hrs

Technical Director: STEPHEN C. FDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. EPH PATTERN IS NOT CONSISTENT

WITH MIDDLE DISTILLATE FUEL.

 Parameter	Results	QC Quai	Units	Method	Allowable Limits	Ext. Date	Anal Date	In it
Percent Solids Hydrocarbons EPH	37.9 4.61		% mg/Kg	SM17 2540G 3510/3550/8100M		09/14	09/10 09/21	EAL JBH
VPH & BTEX Hydrocarbons VPH	0.500	IJ	mg/Kg	EPA 8015M/8020 EPA 5030/8015m		09/10	09/18	WLS
Benzene Toluene Ethylbenzene p&m Xylene o-Xylene	0.025 0.025 0.025 0.025 0.025	ם ם ם	mg/Kg mg/Kg mg/Kg mg/Kg	EPA 8020 EPA 8020 EPA 8020 EPA 8020 EPA 8020		09/10		WES WES

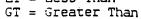
See Special Instructions Above

** See Sample Remarks Above

U = Undetected. Reported value is the practical quantification limit. D = Secondary dilution.

UA = Unavailable NA = Not Analyzed

LT = Less Than





SES Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.#

:93.4693-13 Client Sample ID :LAY-SS06-2SD07

Matrix

:SOIL

Client Name

:ICF KAISER ENGINEERING

Ordered By Project Name

:DEWLINE RI/FS

Project# PWSID

:UA

:SHERI K ACE

:41096-412-01

WORK Order

:70764 Report Completed

:11/09/93

:09/07/93 @ 15:35 hrs

Collected Received

:09/09/93 @ 12:00 hrs

5633 B STREET

TEL: (907) 562-2343 FAX: (907) 561-5301

ANCHORAGE, AK 99518

Technical Director: STEPHEN C. EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL. B = THIS FLAG IS USED WHEN THE ANALYTE

IS FOUND IN THE ASSOCIATED BLANK AS WELL AS IN THE SAMPLE,

				A.	appeil (on	m K	-	
		0.0		_Cli	Mloyable	2 <u>/274</u> /) Ext.	31	
Parameter	Results	Oua)	Unite	Method	Limits	Date	Anal Date	Init
				110 01100				
Percent Solids	87.3		%	SM17 2540G			09/10	EAL
Hydrocarbons EPH	5.19		mg/Kg	3510/3550/8100	M(J)-K.1		09/21	JBH
Hydrocarbons VPH	3.64		mg/Kg	EPA 5030/8015M		09/10	09/18	WLS
Volatile Organics				EPA 8260				
Benzene	0.020		mg/Kg	EPA 8260(J)	1-41	09/10	10/01	KWM
Bromobenzene	0.020	U	mg/Kg	EPA 8260,	, ,,		10/01	KWM
Bromochloromethane	0.020	บ	mg/Kg	EPA 8260			10/01	KWM
Bromodichloromethane	0.020	Ü	mg/Kg	EPA 8260 \			10/01	KWM
Bromoform	0.020	บ	mg/Kg	EPA 8260			10/01	KWM
Bromomethane	0.020	บ	mg/Kg	EPA 8260			10/01	KWM
n-Butylbenzene	0.020	Ü	mg/Kg	EPA 8260			10/01	KWM
sec-Butylbenzene	0.020	Ü	mg/Kg	EPA 8260			10/01	KWM
tert-Butylbenzne	0.020		mg/Kg	EPA 8260			10/01	KWM
Carbon Tetrachloride	0.020	Ü	mg/Kg	EPA 8260			10/01	KWM
Chlorobenzene	0.020	Ü	mg/Kg	EPA 8260			10/01	KWM
Chloroethane	0.020	ŭ	mg/Kg	EPA 8260			10/01	KWM
Chloroform	0.020	Ü	mg/Kg	EPA 8260			10/01	KWM
Chloromethane	0.020	Ü	mg/Kg	EPA 8260			10/01	KWM
2-Chlorotoluene	0.020	Ü	mg/Kg	EPA 8260			10/01	KWM
4-Chlorotoluene	0.020	Ū	mg/Kg	EPA 8260			10/01	KWM
Dibromochloromethane	0.020	Ü	mg/Kg	EPA 8260			10/01	KWM
12Dibromo3Chloropropane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
1,2-Dibromoethane	0.020	U	mg/Kg	EPA 8260		09/10	10/01	KWM
Dibromomethane	0.020	U	mg/Kg	EPA 8260			10/01	KWM
1,2-Dichlorobenzene	0.020	U	mg/Kg	EPA 8260			10/01	-KWM
1,3-Dichlorobenzene	0.020	U	mg/Kg	EPA 8260			10/01	KWM
1,4-Dichlorobenzene	0.020	U	mg/Kg	EPA 8260	•		10/01	KWM
Dichlorodifluoromethane	0.020	U .	mg/Kg	EPA 8260			10/01	KWM
1,1-Dichloroethane	0.020		mg/Kg	EPA 8260 \			10/01	KWM
1,2-Dichloroethane	0.020		mg/Kg	EPA 8260			10/01	KWM
1,1-Dichloroethene	0.020		mg/Kg	EPA 8260			10/01	KWM
cis-1,2-Dichloroethene	0.020		mg/Kg	EPA 8260			10/01	KWM
trans1,2-Dichloroethene	0.020		mg/Kg	EPA 8260			10/01	KWM
1,2-Dichloropropane	0.020	Ü	mg/Kg	EPA 8260			10/01	KWM
1,3-Dichloropropane	0.020	ប	mg/Kg	EPA 8260√7			10/01	KWM
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				2.1.	<i> </i>	_	iled : The	A .
				9.0		(pm	gv uhald	JF.

SGS Member of the SGS Group (Société Générale de Surveillance)



COMMERCIAL TESTING & ENGINEERING CO. ENVIRONMENTAL LABORATORY SERVICES

5/NOE 1908	!	REPO	RT of ANA	LYSIS			5633 B STF	
Chemlab Ref.# :93.4693-13 Client Sample ID :LAY-SS06-2S	•				Budikin	// , TE)RAGE, AK 9 [L: (907) 562- X: (907) 561-	25=0
Matrix :SOIL					any	1 Corporation		
2 2 Dichlemennens	0.020	U	mg/Kg	FPA 826	O(J)-A.1	09/10		KWM
2,2-Dichloropropane 1,1-Dichloropropene	0.020	Ü	mg/Kg	EPA 826		09/10	10/01	KWM
Ethylbenzene	0.025	•	mg/Kg	EPA 826		09/10		KWM
Hexachlorobutadiene	0.020	U	mg/Kg	EPA 826		09/10		KWM
Isopropylbenzene	0.022	•	mg/Kg	EPA 826		09/10		KWM
p-Isopropyltoluene	0.021		mg/Kg	EPA 826	0	09/10		KWM
Methylene Chloride	0.020	U	mg/Kg	EPA 826		09/10		KWM
Napthalene	0.092		mg/Kg	EPA 826	0	09/10		KWM
n-Propylbenzene	0.068		mg/Kg	EPA 826		09/10		KWM
Styrene	0.020	U	mg/Kg	EPA 826	0	09/10 09/10		KWM
1112-Tetrachloroethane	0.020	Ü	mg/Kg	EPA 826		09/10		KWM
1122-Tetrachloroethane	0.020	U	mg/Kg	EPA 826		09/10		KWM
Tetrachloroethene	0.020	U	mg/Kg	EPA 826	20	09/10		KWM
Toluene	0.199	••	mg/Kg	EPA 826		09/10		KWM
1,2,3-Trichlorobenzene	0.020	Ü	mg/Kg	EPA 826 EPA 826		09/10		KWM
1,2,4-Trichlorobenzene	0.020	U	mg/Kg	EPA 826		09/10		KWM
1,1,1-Trichloroethane	0.020	U	mg/Kg	EPA 826		09/10		KWM
1,1,2-Trichloroethane	0.020	U U	mg/Kg mg/Kg	EPA 826		09/10		KWM
Trichloroethene	0.020 0.020	Ü	mg/Kg	EPA 826		09/10		KWM
Trichlorofluoromethane	0.020	Ü	mg/Kg	EPA 826			10/01	KWM
1,2,3-Trichloropropane	0.287	Ų	mg/Kg	EPA 826			10/01	KWM
1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene	0.207		mg/Kg	EPA 826			10/01	KWM
Vinyl Chloride	0.020	U	mg/Kg	EPA 826		09/10	10/01	
p+m-Xylene	0.341	Ū	mg/Kg	EPA 826			10/01	M
o-Xylene	0.110		mg/Kg	EPA 826		09/10	10/01	Him
Semivolatile Organics				EPA 827		09/17	10/26	GV
Phenol	0.228	U	mg/Kg	EPA 827			10/26	GV
bis(2-Chloroethyl)ether	0.228	U	mg/Kg	EPA 827 EPA 827			10/26	GV
2-Chlorophenol	0.228	U	mg/Kg	EPA 82			10/26	GV
1,3-Dichlorobenzene	0.228 0.228	U U	mg/Kg mg/Kg	EPA 82			10/26	GV
1,4-Dichlorobenzene Benzyl Alcohol	0.228	Ü	mg/Kg	EPA 82			10/26	GV
1,2-Dichlorobenzene	0.228	Ü	mg/Kg	EPA 82			10/26	GV
2-Methylphenol	0.228	ប	mg/Kg	EPA 82		09/17	10/26	GV
bis(2-Chloroisopropyl)e	0.228	Ü	mg/Kg	EPA 82	70		10/26	GV
4-Methylphenol	0.228	Ū	mg/Kg	EPA 82	70		10/26	GV
n-Nitroso-di-n-Propylam	0.228	U	mg/Kg	EPA 82			10/26	GV
Hexachloroethane	0.228	U	mg/Kg	EPA 82			10/26	GV
Nitrobenzene	0.228	U	mg/Kg	EPA 82			10/26	- GV
Isophorone	0.228	Ü	mg/Kg	EPA 82			10/26	GV GV
2-Nitrophenol	0.228	U	mg/Kg	EPA 82			10/26 10/26	GV
2,4-Dimethylphenol	0.228	U	mg/Kg	EPA 82	70 70(T) - D1	09/17	10/26	GV
Benzoic Acid	0.228	Ü	mg/Kg	EPA 82	70(J)-D.1	W1 03/17	10/26	GV
bis(2-Chloroethoxy)Meth	0.228	U	mg/Kg	EPA 82 EPA 82		PM9 1 4 09/17	10/26	GV
2,4-Dichlorophenol	0.228	U	mg/Kg	EPA 82			10/26	GV
1,2,4-Trichlorobenzene	0.228	U	mg/Kg	EPA 82			10/26	GV
Naphthalene	0.228 0.228		mg/Kg mg/Kg	EPA 82			10/26	GV
4-Chloroaniline Hexachlorobutadiene	0.228		mg/Kg	EPA 82			10/26	GV
uexaciitotonacaateiie	0.220	J	a, 1,2			3		
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ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4693-13 Client Sample ID :LAY-SS06-2SD07

Matrix :SOIL

5633 B STREET ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

						<u> </u>			
4-Metal Albert A	nloro-3-Methylphenol ethylnaphthalene achlorocyclopentadie 6-Trichlorophenol 5-Trichlorophenol nloronaphthalene itroaniline ethylphthalate naphthylene -Dinitrotoluene itroaniline naphthene -Dinitrophenol enzofuran -Dinitrotoluene thylphthalate nlorophenyl-Phenylet prene itroaniline chylphthalate nlorophenyl-Phenylet prene itrosodiphenylamine romophenyl-Phenyleth achlorobenzene tachlorophenol nanthrene hracene n-Butylphthalate oranthene	0.22 0.22	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	mg/Kg mg/Kg		8270 8270 8270 8270 8270 8270 8270 8270	09/17 09/17	10/26 10/26	
	enz(a,h)Anthracene zo(g,h,i)Perylene	0.2 0.2				8270 (J)-D	09/17 09/17	10/26	- GV GV
Dell	20(9,11,1)1 01310110	0.2		g/ 1/g	ا است			20, 20	
							· ·		

UA = Unavailable

NA = Not AnalyzedLT = Less Than

GT = Greater Than



See Special Instructions Above

See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

:93.4356-12 Chemlab Ref.#

Client Sample ID :LAY-SS06-SW02 POINT LAY

:ICF KAISER ENGINEERING

Matrix

:WATER

WORK Order

:70116

Report Completed :10/06/93

Collected Received

:08/24/93 @ 15:25 hrs.

:08/26/93 @ 12:00 hrs.

5633 B STREET

ANCHORAGE, AK 99518

TEL: (907) 562-2343 FAX: (907) 561-5301

Technical Director: STEPHEN C. EDE Released By :

Client Name Ordered By

:RAY MORRIS

Project Name Project#

:DEW LINE RI/FS :41096-412-01

PWSID

:UA

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init	
 Volatile Organics				EPA 8260					
Benzene	0.0010	U	mg/L	EPA 8260			09/02	MCM	
Bromobenzene	0.0010	U	mg/L	EPA 8260			09/02	MCM	
Bromochloromethane	0.0010	U	mg/L	EPA 8260			09/02	MCM	
Bromodichloromethane	0.0010	U	mg/L	EPA 8260			09/02	MCM	
Bromoform	0.0010	U	mg/L	EPA 8260			09/02	MCM	
Bromomethane	0.0010	U	mg/L	EPA 8260			09/02	MCM	
n-Butylbenzene	0.0010	U	mg/L	EPA 8260			09/02	MCM	
sec-Butylbenzene	0.0010	U	mg/L	EPA 8260			09/02	MCM	
tert-Butylbenzne	0.0010	U	mg/L	EPA 8260			09/02	MC	b
Carbon Tetrachloride	0.0010	U	mg/L	EPA 8260			09/02	MC	,
Chlorobenzene	0.0010	U	mg/L	EPA 8260			09/02	MCH	_
Chloroethane	0.0010	U	mg/L	EPA 8260			09/02	MCM	
Chloroform	0.0010	U	mg/L	EPA 8260			09/02	MCM	
Chloromethane	0.0010		mg/L	EPA 8260			09/02	MCM	
2-Chlorotoluene	0.0010	U	mg/L	EPA 8260			09/02	MCM	
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260			09/02	MCM	
Dibromochloromethane	0.0010		mg/L	EPA 8260			09/02	MCM	
12Dibromo3Chloropropane	0.0010		mg/L	EPA 8260			09/02	MCM	
1,2-Dibromoethane	0.0010		mg/L	EPA 8260			09/02	MCM	
Dibromomethane	0.0010		mg/L	EPA 8260			09/02	MCM	
1,2-Dichlorobenzene	0.0010		mg/L	EPA 8260			09/02	MCM	
1,3-Dichlorobenzene	0.0010		mg/L	EPA 8260			09/02	MCM	
1,4-Dichlorobenzene	0.0010		mg/L	EPA 8260			09/02	MCM	
Dichlorodifluoromethane	0.0010		mg/L	EPA 8260			09/02	MCM	
1,1-Dichloroethane	0.0010		mg/L	EPA 8260			09/02	MCM	
1,2-Dichloroethane	0.0010		mg/L	EPA 8260			09/02	MCM	
1,1-Dichloroethene	0.0010		mg/L	EPA 8260			09/02	MCM	
cis-1,2-Dichloroethene	0.0010		mg/L	EPA 8260			09/02	MCM	
trans1,2-Dichloroethene	0.0010		mg/L	EPA 8260			09/02	MCM	
1,2-Dichloropropane	0.0010		mg/L	EPA 8260			09/02	MCM	
1,3-Dichloropropane	0.0010		mg/L	EPA 8260		09/02	09/02	MCM	
2,2-Dichloropropane	0.0010		mg/L	EPA 8260			09/02	MCM	
1,1-Dichloropropene	0.0010		mg/L	EPA 8260			09/02	MCM	
Ethylbenzene	0.0010		mg/L	EPA 8260			09/02	MCM MCM	
Hexachlorobutadiene	0.0010		mg/L	EPA 8260		09/02	09/02 09/02	MCM	
Isopropylbenzene	0.0010		mg/L	EPA 8260			09/02	MCM	
p-Isopropyltoluene	0.0010	U	mg/L	EPA 8260		09/02	07/02	псв	h



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS cnemlab Ref.# :93.4356-12 5633 B STREET ANCHORAGE, AK 99518 Client Sample ID :LAY-SS06-SW02 POINT LAY TEL: (907) 562-2343 Matrix :WATER FAX: (907) 561-5301

Methylene Chloride	0.0010	U	mg/L	EPA 8260	09/02 09/02	MCM
Napthalene	0.0021		mg/L	EPA 8260	09/02 09/02	MCM
n-Propylbenzene	0.0010	U	mg/L	EPA 8260	09/02 09/02	
Styrene	0.0010	Ū	mg/L	EPA 8260		MCM
1112-Tetrachloroethane	0.0010	บ	•		09/02 09/02	MCM
1122-Tetrachloroethane	0.0010	_	mg/L	EPA 8260	09/02 09/02	MCM
Tetrachloroethene		U	mg/L	EPA 8260	09/02 09/02	MCM
	0.0010	U	mg/L	EPA 8260	09/02 09/02	MCM
Toluene	0.0010	Ü	mg/L	EPA 8260	09/02 09/02	MCM
1,2,3-Trichlorobenzene	0.0010	U	mg/L	EPA 8260	09/02 09/02	MCM
1,2,4-Trichlorobenzene	0.0010	U	mg/L	EPA 8260	09/02 09/02	MCM
1,1,1-Trichloroethane	0.0010	Ü	mq/L	EPA 8260	09/02 09/02	
1,1,2-Trichloroethane	0.0010	Ü	mg/L			MCM
Trichloroethene	0.0010	Ü	-	EPA 8260	09/02 09/02	MCM
Trichlorofluoromethane		_	mg/L	EPA 8260	09/02 09/02	HCM
1,2,3-Trichloropropane	0.0010	Ü	mg/L	EPA 8260	09/02 09/02	HCM
1,2,3-111cilloropropane	0.0010	U	mg/L	EPA 8260	09/02 09/02	MCM
1,2,4-Trimethylbenzene	0.0010	U	mg/L	EPA 8260	09/02 09/02	HCM
1,3,5-Trimethylbenzene	0.0012		mg/L	EPA 8260	09/02 09/02	MCM
Vinyl Chloride	0.0010	U	mq/L	EPA 8260	09/02 09/02	MCM
p+m-Xylene	0.0010	Ū	mg/L	EPA 8260		
o-Xylene	0.0010	ŭ			09/02 09/02	MCM
•	0.0010	U	mg/L	EPA 8260	09/02 09/02	MCM

See Special Instructions Above See Sample Remarks Above

Undetected, Reported value is the practical quantification limit. D = Secondary dilution.

NA = Not Analyzed LT = Less Than GT = Greater Than

UA = Unavailable



SGS Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.#

:93.4354-10

Client Sample ID :LAY-SS06-SW02 POINT LAY

Matrix :WATER

5633 8 STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

Client Name

:ICF KAISER ENGINEERING

Ordered By Project Name

:RAY MORRIS :DEW LINE RI/FS

Project# PWSID

:41096-412-01

:UA

WORK Order

Received

:70106

Report Completed Collected

:10/07/93

:08/24/93

hrs :08/26/93 @ 12:00 hrs

Technical Director: STEPHEN C,

Released By :

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C.

2-Chlorophenol 0.010 U mg/L EPA 8270 08/30 09/06 M 1.3-Dichlorobenzene 0.010 U mg/L EPA 8270 08/30 09/06 M 1.4-Dichlorobenzene 0.010 U mg/L EPA 8270 08/30 09/06 M 1.4-Dichlorobenzene 0.010 U mg/L EPA 8270 08/30 09/06 M 8enzyl Alcohol 0.010 U mg/L EPA 8270 08/30 09/06 M 1.2-Dichlorobenzene 0.010 U mg/L EPA 8270 08/30 09/06 M 1.2-Dichlorobenzene 0.010 U mg/L EPA 8270 08/30 09/06 M 2-Methylphenol 0.010 U mg/L EPA 8270 08/30 09/06 M 4-Methylphenol 0.010 U mg/L EPA 8270 08/30 09/06 M 4-Methylphenol 0.010 U mg/L EPA 8270 08/30 09/06 M Hexachloroethane 0.010 U mg/L EPA 8270 08/30 09/06 M Nitrobenzene 0.010 U mg/L EPA 8270 08/30 09/06 M Sisophorone 0.010 U mg/L EPA 8270 08/30 09/06 M 2-Nitrophenol 0.010 U mg/L EPA 8270 08/30 09/06 M 2-Nitrophenol 0.010 U mg/L EPA 8270 08/30 09/06 M 8enzoic Acid 0.010 U mg/L EPA 8270 08/30 09/06 M Benzoic Acid 0.010 U mg/L EPA 8270 08/30 09/06 M Sis(2-Chloroethoxy)Meth 0.010 U mg/L EPA 8270 08/30 09/06 M 1.2.4-Trichlorobenzene 0.010 U mg/L EPA 8270 08/30 09/06 M Naphthalene 0.010 U mg/L EPA 8270 08/30 09/06 M 4-Chloroaniline 0.010 U mg/L EPA 8270 08/30 09/06 M Hexachlorobutadiene 0.010 U mg/L EPA 8270 08/30 09/06 M Hexachlorobutadiene 0.010 U mg/L EPA 8270 08/30 09/06 M Hexachlorocyclopentadie 0.010 U mg/L EPA 8270 08/30 09/06 M Hexachlorocyclopentadie 0.010 U mg/L EPA 8270 08/30 09/06 M Hexachlorocyclopentadie 0.010 U mg/L EPA 8270 08/30 09/06 M Hexachlorocyclopentadie 0.010 U mg/L EPA 8270 08/30 09/06 M Hexachlorocyclopentadie 0.010 U mg/L EPA 8270 08/30 09/06 M Hexachlorocyclopentadie 0.010 U mg/L EPA 8270 08/30 09/06 M Hexachlorocyclopentadie 0.010 U mg/L EPA 8270 08/30 09/06 M Hexachlorocyclopentadie 0.010 U mg/L EPA 8270 08/30 09/06 M Hexachlorocyclopentadie 0.010 U mg/L EPA 8270 08/30 09/06 M Hexachlorocyclopentadie 0.010 U mg/L EPA 8270 08/30 09/06 M Hexachlorocyclopentadie 0.010 U mg/L EPA 8270 08/30 09/06 M Hexachlorocyclopentadie 0.010 U mg/L EPA 8270 08/30 09/06 M 2-Kitroaniline 0.010 U mg/L EPA 8270 08/30 09/06 M	Parameter	QC R esu lts Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
1,2-Dichlorobenzene 2-Methylphenol 0.010 U mg/L EPA 8270 08/30 09/06 M 0	Phenol bis(2-Chloroethyl)ether 2-Chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene Benzyl Alcohol	0.010 U 0.010 U 0.010 U 0.010 U	mg/L mg/L mg/L	EPA 8270 EPA 8270 EPA 8270 EPA 8270 EPA 8270		08/30 08/30 08/30 08/30 08/30	09/06 09/06 09/06 09/06 09/06	MTT MTT MTT MTT MTT
Isophorone	1,2-Dichlorobenzene 2-Methylphenol bis(2-Chloroisopropyl)e 4-Methylphenol n-Nitroso-di-n-Propylam Hexachloroethane	0.010 U 0.010 U 0.010 U 0.010 U 0.010 U 0.010 U	mg/L mg/L mg/L mg/L mg/L	EPA 8270 EPA 8270 EPA 8270 EPA 8270 EPA 8270		08/30 08/30 08/30 08/30 08/30	09/06 09/06 09/06 09/06 09/06	MTT MTT MTT MTT
1,2,4-Trichlorobenzene	Isophorone 2-Nitrophenol 2,4-Dimethylphenol Benzoic Acid bis(2-Chloroethoxy)Meth	0.010 U 0.010 U 0.010 U 0.010 U	mg/L mg/L mg/L mg/L	EPA 8270 EPA 8270 EPA 8270 EPA 8270 EPA 8270		08/30 08/30 08/30 08/30 08/30	09/06 09/06 09/06 09/06 09/06	MTT MTT MTT MTT MTT
Hexachlorocyclopentadie 0.010 U mg/L EPA 8270 08/30 09/06 MT 2,4,6-Trichlorophenol 0.010 U mg/L EPA 8270 08/30 09/06 MT 2,4,5-Trichlorophenol 0.010 U mg/L EPA 8270 08/30 09/06 MT 2-Chloronaphthalene 0.010 U mg/L EPA 8270 08/30 09/06 MT 2-Nitroaniline 0.010 U mg/L EPA 8270 08/30 09/06 MT 0.010 U mg/L	1,2,4-Trichlorobenzene Naphthalene 4-Chloroaniline Hexachlorobutadiene 4-Chloro-3-Methylphenol	0.010 U 0.010 U 0.010 U 0.010 U 0.010 U	mg/L mg/L mg/L mg/L	EPA 8270 EPA 8270 EPA 8270 EPA 8270		08/30 08/30 08/30 08/30 08/30	09/06 09/06 09/06 09/06	MTT MTT MTT MTT MTT
	Hexachlorocyclopentadie 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronaphthalene	0.010 U 0.010 U 0.010 U 0.010 U 0.010 U	mg/L mg/L mg/L mg/L	EPA 8270 EPA 8270 EPA 8270 EPA 8270 EPA 8270		08/30 08/30 08/30 08/30 08/30	09/06 09/06 09/06 09/06	MTT MTT MTT MTT MTT MTT
Acenaphthylene 0.010 U mg/L EPA 8270 08/30 09/06 M7 2.6-Dinitrotoluene 0.010 U mg/L EPA 8270 08/30 09/06 M7 3-Nitroaniline 0.010 U mg/L EPA 8270 08/30 09/06 M7 Acenaphthene 0.010 U mg/L EPA 8270 08/30 09/06 M7 2.4-Dinitrophenol	Acenaphthylene 2,6-Dinitrotoluene 3-Nitroaniline Acenaphthene 2,4-Dinitrophenol	0.010 U 0.010 U 0.010 U 0.010 U 0.010 U	mg/L mg/L mg/L mg/L	EPA 8270 EPA 8270 EPA 8270 EPA 8270 EPA 8270		08/30 08/30 08/30 08/30 08/30	09/06 09/06 09/06 09/06 09/06	MTT MTT MTT MTT MTT



ENVIRONMENTAL LABORATORY SERVICES

hemlab Ref.#

:93.4354-10

REPORT of ANALYSIS_

Client Sample ID :LAY-SS06-SW02 POINT LAY

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

Matrix :WATER

Dibenzofuran 0.010 U mq/L **EPA** 8270 08/30 09/06 2.4-Dinitrotoluene MTT 0.010 U mg/L **EPA** 8270 08/30 09/06 MTT Diethylphthalate 0.010 U mg/L EPA 8270 08/30 09/06 4-Chlorophenyl-Phenylet MTT 0.010 U mg/L EPA 8270 08/30 09/06 MTT Fluorene 0.010 11 mg/L **EPA** 8270 08/30 09/06 MTT 4-Nitroaniline 0.010 U mg/L **EPA 8270** 08/30 09/06 4,6-Dinitro-2-Methylphe MTT 0.010 U mg/L **EPA** 8270 08/30 09/06 n-Nitrosodiphenylamine MTT 0.010 U mg/L **EPA** 8270 08/30 09/06 MTT 4-Bromophenyl-Phenyleth 0.010 U mg/L EPA 8270 08/30 09/06 MIT Hexachlorobenzene 0.010 U mg/L EPA 8270 08/30 09/06 MTT Pentachlorophenol 0.010 U mg/L EPA 8270 08/30 09/06 MIT Phenanthrene 0.010 U mg/L EPA 8270 08/30 09/06 MTT Anthracene 0.010 U mg/L EPA 8270 08/30 09/06 di-n-Butylphthalate MTT 0.010 Ũ mg/L **EPA** 8270 08/30 09/06 MTT Fluoranthene 0.010 Ħ mq/L **EPA** 8270 08/30 09/06 MTT Pyrene 0.010 IJ ma/L **EPA** 8270 08/30 09/06 Butylbenzylphthalate MIT 0.010 U mg/L **EPA** 8270 08/30 09/06 3,3-Dichlorobenzidine MTT 0.010 U mg/L EPA 8270 08/30 09/06 Benzo(a)Anthracene MTT 0.010 U mg/L EPA 8270 08/30 09/06 MTT Chrysene 0.010 U mg/L EPA 8270 08/30 09/06 bis(2-Ethylhexyl)Phthal MTT 0.010 U mg/L EPA 8270 08/30 09/06 MIT di-n-Octylphthalate 0.010 U mg/L EPA 8270 08/30 09/06 Benzo(b)Fluoranthene MTT 0.010 U mg/L EPA 8270 08/30 09/06 MTT Benzo(k)Fluoranthene 0.010 : U mg/L **EPA** 8270 08/30 09/06 Benzo(a)Pyrene MTT 0.010 U mg/L EPA 8270 08/30 09/06 MIT Indeno(1,2,3-cd)Pyrene 0.010 U mg/L EPA 8270 08/30 09/06 MTT Dibenz(a,h)Anthracene 0.010 U mg/L EPA 8270 08/30 09/06 MTT Benzo(g,h,i)Perylene 0.010 H mg/L EPA 8270 08/30 09/06 MTT

See Special Instructions Above

See Sample Remarks Above

Undetected, Reported value is the practical quantification limit.

= Secondary dilution.

UA = Unavailable NA = Not Analyzed LT = Less Than

GT = Greater Than



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ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

:93.4358-5 Chemlab Ref.#

Client Sample ID :LAY-SS06-SW02 POINT LAY

Matrix

Client Name

:WATER

:ICF KAISER ENGINEERING

Ordered By :RAY MORRIS :DEW LINE RI/FS Project Name Project#

PWSID :UA

:41096-412-01

WORK Order :70131 Report Completed :09/20/93

Collected :08/24/93 @ 15:25 hrs :08/26/93 @ 12:00 hrs Received

5633 B S1

TEL: (907) 562-2343 FAX: (907) 561-5301

ANCHORAGE, AK

Technical Director: STEPHEN C.

Released By :

Sample Remarks: SAMPLE COLLECTED BY: J.P.

Parameter	Results	QC Qual	Taylorits to	Method	Allowable Limits	Ext. Date	Anal Date	Init
Total Metals Analysis								
ICP Screen, ICF				EPA	n/a			
Aluminum	0.10	U	mg/L	EPA 6010			09/06	DLG
Antimony	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Arsenic	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Barium	0.36		mg/L	EPA 6010		09/02	09/06	DLG
Beryllium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Cadmium	0.050	U	mg/L	EPA 6010			09/06	DLG
Calcium	52		mg/L	EPA 6010			09/06	DLG
Chromium	0.050	U	mg/L	EPA 6010			09/06	DLG
Cobalt	0.10	U	mg/L	EPA 6010			09/06	G
Copper	0.050	U	mg/L	EPA 6010			09/06	E G
Iron	5.6		mg/L	EPA 6010			09/06	DLG
Lead	0.10	U	mg/L	EPA 6010			09/06	DLG
Magnesium	26		mg/L	EPA 6010			09/06	DLG
Manganese	1.7		mg/L	EPA 6010			09/06	DLG
Molybdenum	0.050	U	mg/L	EPA 6010			09/06	DLG
Nickel	0.050	U	mg/L	EPA 6010			09/06	DLG
Potassium	5.0	U	mg/L	EPA 6010			09/06	DLG
Selenium	0.10	U	T mg/L	EPA 6010			09/06	DLG
Silver	0.050	U	J mg/L J. 1	EPA 6010			09/06	DLG
Sodium	45		mg/L	EFA 6010			09/17	DFL
Thallium	0.005	U	mg/L	EPA 7841			09/06	BMW
Vanadium	0.050	U	mg/L	EPA 6010			09/06	DLG
Zinc	0.061	U	mg/L	EPA 6010		09/15	09/17	DFL
Dissolved Metals Analys				-				
ICP Screen, ICF				EPA	n/a			
Aluminum	0.10	U	mg/L	EPA 6010			09/06	DLG
Antimony	0.10	U	mg/L	EPA 6010			09/06	DLG
Arsenic	0.10	U	mg/L	EPA 6010			09/06	DLG
Barium	0.34		mg/L	EPA 6010			09/06	DLG
Beryllium	0.050	U	mg/L	EPA 6010			09/06	DLG
Cadmium	0.050	U	mg/L	EPA 6010			09/06	DLG
Calcium	51		mg/L	EPA 6010			09/06	DLG
Chromium	0.050	U	mg/L	EPA 6010			09/06	DLG
Cobalt	0.10	U	mg/L	EPA 6010			09/06	DLG
Copper	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG



SGS Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

5 102 1923		REPOR'	T of ANALY	SIS			5633 B STF	DEST
Chemlab Ref.# Client Sample II	:93.4358-5 D:LAY-SS06-SW02 POIN		31			TE	RAGE, AK 9 L: (907) 562-	99518 -2343
Matrix	:WATER	Trans	Opm			FA	X: (907) 561-	-5301
Iron	0.88		mg/L	EPA	6010	09/02	09/06	DLG
Lead	0.10	U	mg/L	EPA	6010	09/02	09/06	DLG
Magnesium	26		mg/L	EPA	6010	09/02	09/06	DLG
Manganese	1.7		mg/L	EPA	6010	09/02	09/06	DLG
Molybdenum	0.050	U	mg/L	EPA	6010	09/02	09/06	DLG
Nickel	0.050	ប	mg/L	EPA	6010	09/02	09/06	DLG
Potassium	5.0	U	mg/L	EPA	6010	09/02	09/06	DLG
Selenium	0.10	U	mg/L	EPA	6010	09/02	09/06	DLG
Silver	0.050	UI	mg/LJ.	EPA	6010	09/02		DLG
Sodium	44		mg/L	EPA	6010	09/15	09/17	DFL
Thallium	0.005	U	mg/L	EPA	7841	09/03	09/08	BMW
Vanadium	0.050	U	mg/L	EPA	6010	09/02	09/06	DLG
Zinc	0.050	U	mg/L	EPA	6010	09/15	09/17	DFL

All chars or 2/2/94

See Special Instructions Above

** See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable NA = Not Analyzed

LT = Less Than

GT = Greater Than



SGS Member of the SGS Group (Société Générale de Surveillance)

ICF ID	LAY-SS06-S01
F&BI Number	636
Sample Type	soil
Date Received	8/25/93
% Dry Weight	87
Sequence Date	#5-08/25/93
Leaded Gas	
JP-4	<100
Lube Oil	40000 25000 , 23 000 5
Diesel	25000. 23000 3
Spike Level	
Unknown Semi-volatile	
Pentacosane	interferences prevented measurement
Sequence Date	#5-08/25/93
PCB 1221	\U. 1
PCB 1232	<0.1 4 0.5
PCB 1016	<0. 1 4 0.5
PCB 1242	<0. 1 < 0.5
PCB 1248	<0.1 ∠0.5
PCB 1254	<0. 1 40.5 <0.1 40.5
PCB 1260	<0.1 < 0.5
Spike Level	
Dibutyl Chlorendate	290 outside control limits
Sequence Date	
alpha-BHC	
beta-BHC	
gamma-BHC	
delta-BHC	
Heptachlor Aldrin	
Heptachlor Epoxide	
Endosulfan I	
DDE	
Dieldrin	
Endrin	
Endosulfan II	
DDD	
Endrin Aldehyde	
DDT	
Endosulfan Sulfate	
Endrin Ketone	
Methoxy Chlor	
Chlordane	
Dibutyl Chlorendate	
Spike Level	
Vol Sequence	#1&2-08/25/93
CCI4	<0.02 万
TCA	1.8 3
Benzene	< 0.02
TCE	1 3
Toluene	<0.02
PCE	1.3 J
Ethylbenzene	<0.02
Xylenes	<0.04
Gasoline	24 25 J
Spike level	445
BFB	115

RJB 6-14-9r

ICF ID	LAY-SS06-S02	LAY-SS06-S03
F&BI Number	638	640
Sample Type	soil	soil
Date Received	8/25/93	8/25/93
% Dry Weight	77	78
Sequence Date	#5-08/25/93	#5-08/25/93
Leaded Gas		
JP-4	< 60	<80
Lube Oil	2300	<180
Diesel	25000 334∞ J	£80 <6 0
Spike Level		
Unknown Semi-volatile		
Pentacosane	interferences prevented measurement	131
Sequence Date	#5-08/25/93	#5-08/25/93
PCB 1221	<0.1 ∠0.5	<0.1
PCB 1232	<0.1 < 0.5	<0.1
PCB 1016	<0.7 4 0.5	<0.1
PCB 1242	<0.1 40.5	<0.1
PCB 1248	<0. ↑ ⟨0.5	<0.1
PCB 1254	<0.7 40.5	<0.1
PCB 1260	<0.1 4 0.5	<0.1
Spike Level	119%	70.1
Dibutyl Chlorendate	117 70 180 outside control limits	131
Sequence Date	100 outside contro l infilts	#5-08/25/93
alpha-BHC		<0.02 J
beta-BHC		<0.02 3
gamma-BHC		<0.02 3
delta-BHC		<0.02 5
Heptachlor		<0.02 5
Aldrin		<0.02 J
Heptachlor Epoxide		<0.02 5
Endosulfan I		<0.02 3
DDE		<0.02 3
Dieldrin		<0.02 5
Endrin		<0.02 5
Endosulfan II		<0.02 5
DDD		<0.02 5
Endrin Aldehyde		<0.02 \(\mathcal{I} \)
DDT		<0.02 \(\mathcal{I} \)
Endosulfan Sulfate		<0.02 5
Endrin Ketone		< 0.02 T
Methoxy Chlor		50.T 40.5 J
Chlordane		<0.5 J
Dibutyl Chlorendate		131
Spike Level		
Vol Sequence	#1&2-08/25/93	#1&2-08/25/93
CCI4	<0.03 3	<0.03 プ
TCA	1 J	<0.03 I
Benzene	<0.03	< 0.03
TCE	2 5	<0.03 \(\mathcal{I} \)
Toluene	7 .2 3	< 0.03
PCE	4.2 J 43 ズ	27 3
Ethylbenzene	6.8	< 0.03
Xylenes	21 丁	<0.06
Gasoline	7 80 540 3	×2 < 37 J
Spike level	%00 9 10 -	**
BFB	116	118
5, 5	110	110

6-14-91 878

105.15	LAV 6000 604	LAY-SS06-S05	
ICF ID	LAY-SS06-S04	644	
F&BI Number	642	soil	
Sample Type	soil	8/25/93	
Date Received	8/25/93	68	
% Dry Weight	75 #E 00/25/02	#5-08/25/93	
Sequence Date	#5-08/25/93	#5-06/25/93	
Leaded Gas	-150	<160	
JP-4	<150	<160 <160	
Lube Oil	1900	80 2	
Diesel	20000 diesel and motor oil	80 3	
Spike Level	12000 3		
Unknown Semi-volatile	133	115	
Pentacosane	#5-08/25/93	# 5-08/25/93	
Sequence Date PCB 1221	*9-06/25/95 <0.1	<0.1	
PCB 1232	<0.1	<0.1	
PCB 1232 PCB 1016	<0.1	<0.1	
	<0.1	<0.1	
PCB 1242	<0.1	<0.1	
PCB 1248		<0.1	
PCB 1254	<0.1	<0.1	
PCB 1260	<0.1	<0.1	
Spike Level	122	115	
Dibutyl Chlorendate	133	115	
Sequence Date			
alpha-BHC			
beta-BHC			
gamma-BHC delta-BHC			
Heptachlor Aldrin			
Heptachlor Epoxide Endosulfan I			
DDE			
Dieldrin			
Endrin			
Endosulfan II			
DDD			
Endrin Aldehyde			
DDT			
Endosulfan Sulfate			
Endrin Ketone			
Methoxy Chlor			
Chlordane			
Dibutyl Chlorendate			
Spike Level			
Vol Sequence	#1&2-08/25/93	#1&2-08/25/93	
CCI4	<0.03 J	<0.03 J	
TCA	0.5 J	<0.03 プ	
Benzene	< 0.03	<0.03 €0.05 J	
TCE	<0.03 ℧	<0.03 ℧	
Toluene	24	<0.03 40.5	
PCE	<0.03 J	Z E0.0>	
Ethylbenzene	ナリ	<0.03 \(\frac{7}{2}\cdot \(\frac	
Xylenes	19 42 3	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
Gasoline	570 397 J	<2 434 J	
Spike level			_
BFB	124	118	KZB
			6-14-95

	ICF ID	LAY-SS06-S06	LAY-SS06-S07
	F&BI Number	646	648
	Sample Type	soil	soil
	Date Received	8/25/93	8/25/93
	% Dry Weight	49	74
)	Sequence Date	#5-08/25/93	#5-08/25/93
	Leaded Gas		
	JP-4	<80	< 80
	Lube Oil	< 160	<160
	Diesel	45000 62000 丁	£ 80 < 70
	Spike Level		
	Unknown Semi-volatile		
	Pentacosane	interferences prevented measurement	114
	Sequence Date	#5-08/25/93	#5-08/25/93
	PCB 1221	20.1 40.2	<0.5 40.1
	PCB 1232	<0.1 40.2	< 0.5 40.1
	PCB 1016	<0.4 40.2	<0.5 40.1
	PCB 1242	<0.4 40.2	< 8.5 < 0.1
	PCB 1248	< 0.4 40.2	<0.5 < 0.1
	PCB 1254	<0.1 < 0.2	<0.5 < 0.1
	PCB 1260	<0.4 < 0.2	<0.5 < 0.1
	Spike Level	104 %	
	Dibutyl Chlorendate	170 outside control limits	114
	Sequence Date		
	alpha-BHC		
	beta-BHC		
	gamma-BHC		
	delta-BHC		
	Heptachlor		
•	Aldrin		
	Heptachlor Epoxide	-	
	Endosulfan l		
	DDE		
	Dieldrin		
	Endrin		
	Endosulfan II		
	DDD		
	Endrin Aldehyde		
	DDT		
	Endosulfan Sulfate		
	Endrin Ketone		
	Methoxy Chlor		
	Chlordane		
	Dibutyl Chlorendate		
	Spike Level		#4.0.0.00.405.400
	Vol Sequence	#1&2-08/25/93	#1&2-08/25/93
	CCI4	<0.04 5	<0.03 7
	TCA	<0.04 \(\tau \)	<0.03 7
	Benzene	€0.04 ∠ 0.4 3	<0.03 €0.6 J
	TCE	<0.04 J	<0.03 J
	Toluene	< 0.04	<0.03 ∠0.6
	PCE	<0.04 5	<0.03 7
1	Ethylbenzene	<0.04 ∠0.4 J	<0.03. <0.6 J
ř	Xylenes	16 🏂	< 0.06 < 0.6 J
	Gasoline	500 316 J	43 <40 J
	Spike level		
	BFB	121	117

RTS 6-14-95

ICF ID	LAY-SS06-S07	LAY-SS06-S07
F&BI Number	648 ms	648 msd
Sample Type	soil	soil
Date Received	8/25/93	8/25/93
% Dry Weight		
Sequence Date	#5-08/25/93	#5-08/25/93
Leaded Gas		
JP-4		
Lube Oil		
Diesel	77	100
Spike Level	500	500
Unknown Semi-volatile		
Pentacosane	128	170 outside control limits
Sequence Date	#5-08/25/93	#5-08/25/93
PCB 1221		
PCB 1232		
PCB 1016		
PCB 1242		
PCB 1248		
PCB 1254	110	120
PCB 1260		_
Spike Level	5	5
Dibutyl Chlorendate	128	170 outside control limits
Sequence Date		
alpha-BHC		
beta-BHC		
gamma-BHC		
delta-BHC		
Heptachlor		
Aldrin		
Heptachlor Epoxide Endosulfan I		
DDE		
Dieldrin		
Endrin		
Endosulfan II		
DDD		
Endrin Aldehyde		
DDT		
Endosulfan Sulfate		
Endrin Ketone		
Methoxy Chlor		
Chlordane		
Dibutyl Chlorendate		
Spike Level		
Vol Sequence	#1&2-08/25/93	#1&2-08/25/93
CCI4	79	97
TCA	103	87
Benzene	106	101
TCE	106	102
Toluene	95	98
PCE	81	76
Ethylbenzene	110	115
Xylenes	115	112
Gasoline	_	_
Spike level	1	1
BFB	101	113

ICF ID	LAY-SS06-S08
F&BI Number	650
Sample Type	soil
Date Received	8/25/93
% Dry Weight	71
Sequence Date	#5-08/25/93
Leaded Gas	00,20,00
JP-4	<100
Lube Oil	12000
Diesel	2500 Z 2600 Z
·	23000 - 500
Spike Level Unknown Semi-volatile	
	interferences provented measurement
Pentacosane	interferences prevented measurement
Sequence Date	#5-08/25-93 ≤0.1 40.3
PCB 1221	F 1 - 1 - 1
PCB 1232	×0.7 40.7
PCB 1016	<0.7 4 0.2
PCB 1242	<0.7 40.2
PCB 1248	× 0.1 40.2
PCB 1254	40.7 < 0.2
PCB 1260	₹0.1 < 0.2
Spike Level	
Dibutyl Chlorendate	160 outside control limits
Sequence Date	#5-08/25/93
alpha-BHC	<0.02 ⋾
beta-BHC	<0.02 ブ
gamma-BHC	<0.02 J
delta-BHC	<0.02 J
Heptachlor	<0.02 J
Aldrin	<0.02 3
Heptachlor Epoxide	<0.02 丁
Endosulfan I	<0.02 3
DDE	<0.02 J
Dieldrin	<0.02 J
Endrin	<0.02 \(\mathcal{I} \)
Endosulfan II	<0.02 J
DDD	<0.02 \(\mathcal{J} \)
Endrin Aldehyde	<0.02 J
DDT	<0.02 J
Endosulfan Sulfate	<0.02 J
Endrin Ketone	<0.02 J
Methoxy Chlor	<0.1 <0.5 J
Chlordane	<0.5 J
Dibutyl Chlorendate	160 outside recovery limits
•	100 datside recovery illints
Spike Level	#1 9 0 00 /05 /00
Vol Sequence	#1&2-08/25/93
CCI4	<0.03 7
TCA	<0.03 J
Benzene	<0.03
TCE	<0.03 ₮
Toluene	< 0.03
PCE	<0.03 罨
Ethylbenzene	< 0.03
Xylenes	< 0.06
Gasoline	& <2 J
Spike level	
BFB	118

ICF ID	LAY-SS06-S09	LAY-SS06-S10	
F&BI Number	652	654	
Sample Type	soil	soil	
Date Received	8/25/93	8/25/93	
% Dry Weight	77	78	
Sequence Date	#5-08/25/93	#5-08/25/93	
Leaded Gas			
JP-4	<100	<50	
Lube Oil	40000	<100	
Diesel	18000 5	£50 < 60	
Spike Level	10000		
Unknown Semi-volatile			
Pentacosane	interferences prevented measurement		
	#5-08/25-93	#5-08/25-93	
Sequence Date PCB 1221	70.1 40.5	<0.1	
PCB 1232	20.1. 40.5	<0.1	
· =-	₹ 0.1. ⟨ 0.5	<0.1	
PCB 1016	<0.1 < 0.5	<0.1	
PCB 1242	<0.4 < 0.5	<0.1	
PCB 1248	<0.5	<0.1	
PCB 1254		<0.1	
PCB 1260	<0.1 < 0.5	.	
Spike Level	200 avaida append limita	- 222 74%	
Dibutyl Chlorendate	220 outside control limits	77 0	
Sequence Date			
alpha-BHC			
beta-BHC			
gamma-BHC			
delta-BHC			
Heptachlor			
Aldrin			
Heptachlor Epoxide			
Endosulfan I			
DDE			
Dieldrin			
Endrin			
Endosulfan II			
DDD			
Endrin Aldehyde			
DDT			
Endosulfan Sulfate			
Endrin Ketone			
Methoxy Chlor Chlordane			
Dibutyl Chlorendate Spike Level			
Vol Sequence	#1&2-08/25/93	#1&2-08/25/93	
CCI4	<0.03 3	<0.03 J	
TCA	<0.03 J	<0.03 J	
Benzene	< 0.03	<0.03 < 0.6 [₹]	
TCE	<0.03 ℷ	<0.03 ブ	
Toluene	0.2	< 0.03 ∠ ∪. 6	
PCE	0.1 J	<0.03 T	
Ethylbenzene	3	<0.03 <0.6 J	
Xylenes	8 J	< 0.04 0.6 J	
Gasoline	71 48 J	43 422 J	
Spike level	,, ,		
BFB	114	115	
		RJB	سم
		6-14-8	U

ICF ID	LAY-SS06-S11	LAY-SS06-SD01
F&BI Number	656	470
Sample Type	soil	soil
Date Received	8/25/93	8/24/93
% Dry Weight	82	88
Sequence Date	#5-08/25/93	#5-08/25/93
Leaded Gas		
JP-4	<50	<60
Lube Oil	<100	<120
Diesel	8300 7600 ゴ	7600 10400 Z
Spike Level		
Unknown Semi-volatile	116%	
Pentacosane	interferences prevented measurement	106
Sequence Date	·	#5-08/25/93
PCB 1221	< 0.1	< 0.1
PCB 1232	< 0.1	< 0.1
PCB 1016	<0.1	<0.1
PCB 1242	<0.1	<0.1
PCB 1248	<0.1	<0.1
PCB 1254	<0.1	<0.1
PCB 1260	<0.1	<0.1
Spike Level	160 99%	
Dibutyl Chlorendate	160 outside control limits	106
Sequence Date		
alpha-BHC		
beta-BHC		
gamma-BHC		
delta-BHC		
Heptachlor		
Aldrin		
Heptachlor Epoxide		
Endosulfan I	•	
DDE		
Dieldrin		
Endrin		
Endosulfan II		
DDD		
Endrin Aldehyde		
DDT		
Endosulfan Sulfate		
Endrin Ketone		
Methoxy Chlor		
Chlordane		
Dibutyl Chlorendate		
Spike Level		
Vol Sequence	#1&2-08/25/93	#1&2-08/25/93
CCI4	<0.02 J	<0.03 ₮
TCA	0.7 3	< 0.03 T
Benzene	< 0.02	< 0.03
TCE	<0.02 J	< 0.03 %
Toluene	< 0.02	< 0.03 0.16
PCE	<0.02 J	<0.03 5
Ethylbenzene	1.1	2،5
Xylenes	3.9 5	10° 8.15
Gasoline	- 220 150 J	450 905
Spike level		
BFB	119	105
		P-

RJB 6-14-95

ICF ID F&BI Number	LAY-SS06-SD01 470 dup	LAY-SS06-SD01 470 ms	LAY-SS06-SD01 470 msd	LAY-SS06-SD02 472	
Sample Type	soil	soil	soil	soil	
Date Received	8/24/93	8/24/93	8/24/93	8/24/93	
	0/24/00	0/24/00	0,21,00	84	
% Dry Weight	#5-08/25/93			#5-08/25/93	
Sequence Date	#5-00/25/35			# 0 00/20/00	
Leaded Gas	-60			<60	
JP-4	< 60			<120	
Lube Oil	<120 <u>8600</u> 11800	, 		<60	
Diesel	8860 11 800	, 3		\00	
Spike Level					
Unknown Semi-volatile	445	107	134	96	
Pentacosane	115	137		#5-08/25/93	
Sequence Date	#5-08/25/93	#5-08/25/93	#5-08/25/93	#5-06/25/93 <0.1	
PCB 1221	< 0.1			<0.1	
PCB 1232	<0.1			<0.1	
PCB 1016	<0.1				
PCB 1242	< 0.1			<0.1	
PCB 1248	< 0.1			<0.1	
PCB 1254	< 0.1	130	138	<0.1	
PCB 1260	< 0.1			<0.1	
Spike Level		5	5		
Dibutyl Chlorendate	115	137	134	96	
Sequence Date					
alpha-BHC					
beta-BHC					
gamma-BHC					
delta-BHC					
Heptachlor					
Aldrin					
Heptachlor Epoxide					
Endosulfan I					
DDE					
Dieldrin					
Endrin					
Endosulfan II					
DDD					
Endrin Aldehyde					
DDT					
Endosulfan Sulfate					
Endrin Ketone					
Methoxy Chlor					
Chlordane					
Dibutyl Chlorendate					
Spike Level				*************	
Vol Sequence		#1&2-08/25/93	#1&2-08/25/93	#1&2-08/25/93	
CCI4				< 0.03 5	
TCA				< 0.03 \(\infty \)	
Benzene		87	87	< 0.03	
TCE		88	89	<0.03 उ	
Toluene		90	90	<0.03	
PCE		94	94	<0.03 🛣	
Ethylbenzene		128	112	< 0.03	
Xylenes				< 0.06	, -
Gasoline		•	A	£3 <1:	
Spike level		1	1	404	0.0
BFB		116	113	104	RTB
					6-14-95

ICF ID F&BI Number	LAY-SS06-SD03 474	LAY-SS06-SD04 476	LAY-SS06-SW01 501
Sample Type	soil	soil	water
Date Received	8/24/93	8/24/93	8/25/93
% Dry Weight	90	34	0,20,00
Sequence Date	#5-08/25/93	#5-08/25/93	#5-08/27/93
Leaded Gas	# O OO/20/00	## 00/20/00	0 00/2/100
JP-4	<60	< 150	< 1000
Lube Oil	<120	620	< 2000
Diesel	<60	250 1570	
Spike Level	100	200 .570	7 11000
Unknown Semi-volatile			
Pentacosane	88	102	128
Sequence Date	#5-08/25/93	#5-08/25/93	
PCB 1221	<0.1	<0 ,1 ∠0.3	
PCB 1232	<0.1	< 0.1 40.3	
PCB 1016	<0.1	< 0.1 40.3	
PCB 1242	<0.1	< 0.1 40.3	
PCB 1248	<0.1	<0.1 < 0.3	
PCB 1254	<0.1		
PCB 1260	<0.1	<0.1 <0.3 <0.1 <0.3	
	<0.1	< U.1 < 3. >	
Spike Level Dibutyl Chlorendate	88	102	
	00	102	
Sequence Date alpha-BHC			
beta-BHC			
gamma-BHC			
delta-BHC			
Heptachlor			
Aldrin			
Heptachlor Epoxide			
Endosulfan I			
DDE Distalais			
Dieldrin			
Endrin			
Endosulfan II DDD			
			
Endrin Aldehyde DDT			
Endosulfan Sulfate			
Endrin Ketone			
Methoxy Chlor Chlordane			
Dibutyl Chlorendate			
Spike Level			
Vol Sequence	#1&2-08/25/93	#1&2-08/25/93	
CCI4	#1 42 -00/25/95 <0.03 万	<0.05 J	
TCA	<0.03 J <0.03 J	<0.05 \$\frac{2}{5}\$	
	< 0.03	0.3 I	
Benzene			
TCE	<0.03 7	<0.05 J	
Toluene	< 0.03	0.9	
PCE	< 0.03 \$	<0.05 ፲	
Ethylbenzene	< 0.03	1.5	
Xylenes	< 0.06	6 5	
Gasoline	×3 413	90° 59 5	
Spike level	400	4.00	
BFB	120	127	

RTB 64-95

ICF ID F&BI Number Sample Type Date Received % Dry Weight Sequence Date	LAY-SS06-SW01 619 water 8/25/93	LAY-SS06-SW02 567 water 8/25/93 #5-08/27/93	LAY-SS06-SW02 622 water 8/25/93	
Leaded Gas				
JP-4		<1000		
Lube Oil		< 2000		
Diesel		<1000 J		
Spike Level				
Unknown Semi-volatile		104		
Pentacosane Comunes Date		104		
Sequence Date PCB 1221				
PCB 1232				
PCB 1016				
PCB 1242				
PCB 1248				
PCB 1254				
PCB 1260				
Spike Level				
Dibutyl Chlorendate				
Sequence Date				
alpha-BHC				
beta-BHC				
gamma-BHC delta-BHC				
Heptachlor				
Aldrin				
Heptachlor Epoxide				
Endosulfan i				
DDE				
Dieldrin				
Endrin				
Endosulfan II DDD				
Endrin Aldehyde				
DDT				
Endosulfan Sulfate				
Endrin Ketone				
Methoxy Chlor				
Chlordane				
Dibutyl Chlorendate				
Spike Level	#28 4 00/25/02		#3&4-08/25/93	
Vol Sequence CCI4	#3&4-08/25/93 <1		*3&4-00/23/33 <1	
TCA	<1		<1	
Benzene	<1		<1	
TCE	<1		<1	
Toluene	<1		<1	
PCE	<1		<1	
Ethylbenzene	<1		<1	
Xylenes	<2	, - -	<2 < 100 T	
Gasoline	550 < 100	<i>J</i>	<50 ∠100 J	
Spike level BFB	91		87	
DED	Ji		. • • •	

RJB 6-14-95

ICF ID	LAY-SS06-SW03	LAY-SS06-SW03	LAY-SS06-SW04
F&BI Number	500	626	499
Sample Type	water	water	water
Date Received	8/25/93	8/25/93	8/25/93
% Dry Weight			
Sequence Date	#5-08/27/93		#5-08/27/93
Leaded Gas			
JP-4	<1000		<1000
Lube Oil	<2000		<2000
Diesel	<1000		<1000
Spike Level			
Unknown Semi-volatile			
Pentacosane	105		89
Sequence Date			
PCB 1221			
PCB 1232			
PCB 1016			
PCB 1242			
PCB 1248			
PCB 1254			
PCB 1260			
Spike Level			
Dibutyl Chlorendate			
Sequence Date			
alpha-BHC			
beta-BHC			
gamma-BHC			
delta-BHC			
Heptachlor			
Aldrin			
Heptachlor Epoxide	•		
Endosulfan I			
DDE			
Dieldrin			
Endrin			
Endosulfan II			
DDD			
Endrin Aldehyde			
DDT			
Endosulfan Sulfate			
Endrin Ketone			
Methoxy Chlor			
Chlordane			
Dibutyl Chlorendate			
Spike Level			
Vol Sequence		#3&4-08/25/93	
CCI4		<1	
TCA		<1	
Benzene		<1	
TCE		<1	
Toluene		<1	
PCE		<1	
Ethylbenzene		<1	
Xylenes		<2	
Gasoline		≤50 <100	7
Spike level		-	
BFB		98	

(278 6-14-95 ICF ID LAY-SS06-SW04 F&BI Number 616 Sample Type water 8/25/93 **Date Received** % Dry Weight Sequence Date Leaded Gas JP-4 Lube Oil Diesel Spike Level Unknown Semi-volatile Pentacosane Sequence Date PCB 1221 PCB 1232 **PCB 1016** PCB 1242 PCB 1248 PCB 1254 PCB 1260 Spike Level Dibutyl Chlorendate Sequence Date alpha-BHC beta-BHC gamma-BHC delta-BHC Heptachlor Aldrin Heptachlor Epoxide Endosulfan I DDE Dieldrin Endrin Endosulfan II DDD Endrin Aldehyde DDT Endosulfan Sulfate **Endrin Ketone** Methoxy Chlor Chlordane Dibutyl Chlorendate Spike Level #3&4-08/25/93 Vol Sequence < 1 CCI4 **TCA** < 1 <1 Benzene TCE < 1 < 1 Toluene < 1 PCE <1 Ethylbenzene <2 **Xylenes** 4100 J ≤50 Gasoline

89

Spike level BFB

ANALYTICAL DATA SHEETS FOR THE DRAINAGE PATHWAY FROM POL TANKS (SS07)



ENVIRONMENTAL LABORATORY SERVICES

hemlab Ref.#

:93.4354-9

Matrix

Client Sample ID :LAY-AOC4_SD02 POINT LAY :SOIL SSO7

Client Name

:ICF KAISER ENGINEERING

Ordered By Project Name

:RAY MORRIS :DEW LINE RI/FS :41096-412-01

Project# PWSID

:UA

REPORT of ANALYSIS

ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

5633 B STREET

WORK Order :70106 Report Completed :10/07/93

Collected :08/24/93

hrs Received :08/26/93 @ 12:00 hrs

Technical Director: STEPHEN.C. EDE Released By : Say

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. SAME RESULTS FOR 8270 ARE NOT VALID

DUE TO POOR OR NO SURROGATE RECOVERY.

 Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date		In it
Volatile Organics								
Benzene	0.025	ij	mg/Kg	EPA 8260				
Bromodenzene	0.025	Ü	mg/Kg	EPA 8260			09/13	KWM
Bromochloromethane	0.025	Ü	mg/Kg	EPA 8260			09/13	KWM
Bromodichloromethane	0.025	Ü	mg/Kg	EPA 8260			09/13	KWM
Bromoform	0.025	Ü	mg/Kg	EPA 8260			09/13	KWM
Bromomethane	0.025	ŭ	mg/Kg	EPA 8260 EPA 8260			09/13	KWM
n-Butylbenzene	0.025	Ü	mg/Kg	EPA 8260			09/13	KWM
s ec -Butylbenzene	0.025	Ü	mg/Kg			08/26		KWM
tert-Butylbenzne	0.025	_	mg/Kg	EPA 8260			09/13	KWM
Carbon Tetrachloride	0.025	Ü	mg/Kg	EPA 8260		08/26		KWM
Chlorobenzene .	0.025	Ü	mg/Kg	EPA 8260		08/26		KWM
Chloroethane	0.025	Ü	mg/Kg	EPA 8260		08/26		KWH
Chloroform	0.025	Ü	mg/Kg	EPA 8260		08/26		KWM
Chloromethane	0.025	Ü	mg/Kg	EPA 8260		08/26		KWM
2-Chlorotoluene	0.025	Ü	mg/Kg	EPA 8260		08/26		KWH
4-Chlorotoluene	0.025	Ü	mg/Kg	EPA 8260		08/26		KWM
Dibromochloromethane	0 025	Ü	mg/Kg	EPA 8260		08/26		KWM
12Dibromo3Chloropropane	0.025	Ü	mg/Kg	EPA 8260		08/26		KWM
1,2-Dibromoethane	0.025	Ü	mg/Kg	EPA 8260		08/26		KWM
Dibromomethane	0.025	Ü	mg/Kg	EPA 8260		08/26		KWM
1,2-Dichlorobenzene	0.025	U	mg/Kg	EPA 8260		08/26		KWM
1,3-Dichlorobenzene	0.025	ŭ	mg/Kg	EPA 8260		08/26		KWH
1,4-Dichlorobenzene	0.025	Ü	mg/Kg	EPA 8260 EPA 8260		08/26		KWM
Dichlorodifluoromethane	0.025	Ü	mg/Kg	EPA 8260		08/26		KWM
1,1-Dichloroethane	0.025	Ü	mg/Kg	EPA 8260		08/26		KWM
1,2-Dichloroethane	0.025	Ü	mg/Kg	EPA 8260		08/26		KWM
1.1-Dichloroethene	0.025	บั	mg/Kg	EPA 8260		08/26		KWM
cis-1,2-Dichloroethene	0.025	Ū	mg/Kg	EPA 8260		08/26		KWM
trans1,2-Dichloroethene	0.025	Ū	mg/Kg	EPA 8260		08/26		KWM
1,2-Dichloropropane	0.025		mg/Kg	EPA 8260		08/26		KWM
1,3-Dichloropropane	0.025		mg/Kg	EPA 8260		08/26		KWM
2,2-Dichloropropane	0.025		mg/Kg	EPA 8260		08/26		KWM
1.1-Dichloropropene	0.025		mg/Kg	EPA 8260		08/26		KWM
rtnylbenzene	0.025		mg/Kg	EPA 8260		08/26		KWM
Hexachlorobutadiene	0.025		mg/Kg	EPA 8260		08/26		KWM
Isopropylbenzene	0.025		mg/Kg	EPA 8260		08/26		KWM
	-	-	ביי וני	LL A 0200		08/26	09/13	KWM



ENVIRONMENTAL LABORATORY SERVICES

REPORT OF ANALYSIS SCHOOL

Chemlab Ref.# Client Sample ID Matrix	:93.4354-9 :LAY-AOC4-SD02 :SOIL 5807	POINT LAY	•
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5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

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Matrix :SOIL 5507	OZ TOTKI	uп.	L		
p-Isopropyltoluene	0.025	Ü	m g/ Kg	EPA 8260	
Methylene Chloride	0.025	Ü	mg/Kg	EPA 8260	
Napthalene	0.025	Ü	mg/Kg	EPA 8260	
n-Propylbenzene	0.025	Ü	mg/Kg	EPA 8260	
Styrene	0.025	Ü	mg/Kg	EPA 8260	
1112-Tetrachloroethane	0.025	Ŭ	mg/Kg	EPA 8260	
1122-Tetrachloroethane	0.025	Ü	m g/ Kg	EPA 8260	
Tetrachloroethene		Ū	mg/Kg	EPA 8260	
Toluene		Ü	mg/Kg	EPA 8260	
1,2,3-Trichlorobenzene		Ü	mg/Kg	EPA 8260	
1,2,4-Trichlorobenzene		Ü	mg/Kg	EPA 8260	
1,1,1-Trichloroethane		Ü	mg/Kg	EPA 8260	
1,1,2-Trichloroethane		Ü	mg/Kg	EPA 8260	
Trichloroethene		U	mg/Kg	EPA 8260	
Trichlorofluoromethane			mg/Kg	EPA 8260	
1,2,3-Trichloropropane	0.025	· ,	m g/K g	EPA 8260	
1,2,4-Trimethylbenzene	0.025	.;	m g/K g	EPA 8260	
1,3,5-Trimethylbenzene	0.025	ij	mg/Kg	EPA 8260	
Vinyl Chloride) :	m g/K g	EPA 8260	
p+m-Xylene	0.025		m g/K g	EPA 8260	
o-Xylene		Ü	m g/K g	EPA 8260	
Semivolatile Organics				EPA 8270	
Phenol	**.		m g/K g	EPA 8270	
bis(2-Chloroethyl)ether	**		mg/Kg	EPA 8270	
2-Chlorophenol	**		mg/Kg	EPA 8270	
1,3-Dichlorobenzene	**		mg/Kg	EPA 8270	
1,4-Dichlorobenzene	**		mg/Kg	EPA 8270	
Benzyl Alcohol	**		m g/K g	EPA 8270	
1,2-Dichlorobenzene	**		mg/Kg	EPA 8270	
2-Methylphenol	**		mg/Kg	EPA 8270	
bis(2-Chloroisopropyl)e	**		mg/Kg	EPA 8270	
4-Methylphenol	**		mg/Kg	EPA 8270	
n-Nitroso-di-n-Propylam	**		mg/Kg	EPA 8270	
Hexachloroethane	**		mg/Kg	EPA 8270	
Nitrobenzene	**		mg/Kg	EPA 8270	
Isophorone	**		mg/Kg	EPA 8270	
2-Nitrophenol	**		mg/Kg	EPA 8270	
2,4-Dimethylphenol	**		mg∕K g	EPA 8270	
Benzoic Acid	**		mg/Kg	EPA 8270	
bis(2-Chloroethoxy)Meth 2,4-Dichlorophenol	**		m g/K g	EPA 8270	
1,2,4-Trichlorobenzene	**		mg/Kg	EPA 8270	
Naphthalene	**		mg/Kg	EPA 8270	
4-Chloroaniline	**		mg/Kg	EPA 8270	
Hexachlorobutadiene	**		mg/Kg	EPA 8270	
4-Chloro-3-Methylphenol	**		mg/Kg	EPA 8270	
2-Methylnaphthalene	**		mg/Kg	EPA 8270	
Hexachlorocyclopentadie	**		mg/Kg	EPA 8270	
2,4,6-Trichlorophenol	**		mg/Kg	EPA 8270	
2,4,5-Trichlorophenol	**		mg/Kg	EPA 8270	
-1.10 IIICHIOLOPHENOI	* * *		mg/Kg	EPA 8270	





ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.#

:93.4354-9

Client Sample ID :LAY-AOC4-SD02 POINT LAY

:SOIL SSOT

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

2-Chloronaphthalene 2-Nitroaniline	**	mg/Kg	EPA 8270
Dimethylphthalate	**	mg/Kg	EPA 8270
Acenaphthylene	**	mg/Kg	EPA 8270
2,6-Dinitrotoluene	**	mg/Kg	EPA 8270
3-Nitroaniline	**	mg/Kg	EPA 8270
Acenaphthene	**	mg/Kg	EPA 8270
2,4-Dinitrophenol	**	mg/Kg	EPA 8270
4-Nitrophenol	**	mg/Kg	EPA 8270
Dibenzofuran	**	mg/Kg	EPA 8270
2,4-Dinitrotoluene		m g/K g	EPA 8270
Diethylphthalate	**	mg/Kg	EPA 8270
	**	m g/K g	EPA 8270
4-Chlorophenyl-Phenylet Fluorene	**	m g/K g	EPA 8270
4-Nitroaniline	**	m g∕K g	EPA 8270
	**	m g/K g	EPA 8270
4,6-Dinitro-2-Methylphe	**	m g/K g	EPA 8270
n-Nitrosodiphenylamine	**	mg/Kg	EPA 8270
4-Bromophenyl-Phenyleth Hexachlorobenzene	**	mg∕K g	EPA 8270
Pentachlanehenal	**	mg/Kg	EPA 8270
Pentachlorophenol Phenanthrene	**	m g/K g	EPA 8270
Anthracene	**	m g/K g	EPA 8270
	**	m g/ Kg	EPA 8270
di-n-Butylphthalate	**	m g∕K g	EPA 8270
Fluoranthene Pyrene	**:	mg/Kg	EPA 8270
	. **	mg/Kg	EPA 8270
Butylbenzylphthalate	**	mg/Kg	EPA 8270
3,3-Dichlorobenzidine	**	mg/Kg	EPA 8270
Benzo(a)Anthracene	**	mg/Kg	EPA 8270
Chrysene	**	mg/Kg	EPA 8270
bis(2-Ethylhexyl)Phthal	**	mg/Kg	EPA 8270
di-n-Octylphthalate	**	mg/Kg	EPA 8270
Benzo(b)Fluoranthene	**	mg/Kg	EPA 8270
Benzo(k)Fluoranthene	**	mg/Kg	EPA 8270
Benzo(a)Pyrene	**	mg/Kg	EPA 8270
Indeno(1,2,3-cd)Pyrene	**	mg/Kg	EPA 8270
Dibenz(a,h)Anthracene	**	mg/Kg	EPA 8270
Benzo(g,h,i)Perylene	**	mg/Kg	EPA 8270
		J J	

See Special Instructions Above

See Sample Remarks Above

= Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed

LT = Less Than

GT = Greater Than



SSS Member of the SGS Group (Société Générale de Surveillance)



والراز المحالية الوالوا

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

:93.4692-6 Chemlab Ref.# Client Sample ID :LAY-AOC4-2SD05

:SOIL SS\$7 Matrix

:ICF KAISER ENGINEERING Client Name

Ordered By :SHERI K ACE Project Name :DEW LINE RI/FS :41096-412-01 Project#

PWSID :UA

5633 B STREET ANCHORAGE, AK 99518

TEL: (907) 562-2343 FAX: (907) 561-5301

hrs

:70792 WORK Order

:10/01/93 Report Completed

:09/07/93 @ 17:25 Collected Received

:09/09/93 @ 12:00

Technical Director: STEPHEN C. EDE Released By :

Molifier/Connusts

10.3 MG/KG OF EPH PATTERN IS NOT Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA.

CONSISTENT WITH MIDDLE DISTILLATE FUEL.

	•			Character of Street				
Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init.
Percent Solids	72.8		 %	SM17 2540G			09/10	EAL
Hydrocarbons VPH	0.600	U	mg/Kg	EPA 5030/8015M				WLS
Hydrocarbons EPH	27.7		mg/Kg	3510/3550/8100	1(I)-K.1	09/14	09/17	JBF:
Volatile Organics				EPA 8260	Λ. Ι			
Benzene	0.030		mg/Kg	EPA 8260(J)	-H.1		09/28	KWE
Bromobenzene	0.030		mg/Kg	EPA 8260			09/28	KWE
Bromochloromethane	0.030		mg/Kg	EPA 8260			09/28	KM1
Bromodichloromethane	0.030		mg/Kg	EPA 8260			09/28	KWI:
Bromoform	0.030		mg/Kg	EPA 8260			09/28	KWM:
Bromomethane	0.030		mg/Kg	EPA 8260	•		09/28	KWE.
n-Butylbenzene	0.030		mg/Kg	EPA 8260			09/28	KWF.
sec-Butylbenzene	0.030	U	mg/Kg	EPA 8260			09/28	KWE
tert-Butylbenzne	0.030	ប	mg/Kg	EPA 8260			09/28	KWI
Carbon Tetrachloride	0.030	U	mg/Kg	EPA 8260			0 9/28	KWE
Chlorobenzene	0.030	U	mg/Kg	EPA 8260			09/28	KWI
Chloroethane	0.030	U	mg/Kg	EPA 8260			09/28	KWE
Chloroform	0.030	U	mg/Kg	EPA 8260			09/28	KWE
Chloromethane	0.030	U	mg/Kg	EPA 8260			09/28	KWE
2-Chlorotoluene	0.030	U	mg/Kg	EPA 8260			09/28	KWE
4-Chlorotoluene	0.030	U	mg/Kg	EPA 8260			09/28	KWH
Dibromochloromethane	0.030	U	mg/Kg	EPA 8260			09/28	KWH
12Dibromo3Chloropropane	0.030	ប	mg/Kg	EPA 8260			09/28	KWM
1,2-Dibromoethane	0.030		mg/Kg	EPA 8260			09/28	KWE
Dibromomethane	0.030	ប	mg/Kg	EPA 8260			09/28	KWM
1,2-Dichlorobenzene	0.030		mg/Kg	EPA 8260			09/28	KWE
1,3-Dichlorobenzene	0.030	Ŭ	mg/Kg	EPA 8260			09/28	KWM
1,4-Dichlorobenzene	0.030		mg/Kg	EPA 8260			09/28	KWH
Dichlorodifluoromethane	0.030		mg/Kg	EPA 8260		09/10	09/28	KWH
1.1-Dichloroethane	0.030		mg/Kg	EPA 8260			09/28	KWM
1,2-Dichloroethane	0.030		mg/Kg	EPA 8260			09/28	KWH
1,1-Dichloroethene	0.030		mg/Kg	EPA 8260		09/10	09/28	KWM
cis-1,2-Dichloroethene	0.030		mg/Kg	EPA 8260			09/28	KWE
trans1,2-Dichloroethene	0.030		mg/Kg	EPA 8260	,	09/10	09/28	KWM
1,2-Dichloropropane	0.030		mg/Kg	EPA 8260		09/10	09/28	KWH
1,3-Dichloropropane	0.030		mg/Kg	EPA 8260		09/10	09/28	KWE
2,2-Dichloropropane	0.030		mg/Kg	EPA 8260			09/28	KWM
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Compiled: 8m





ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4692-6 Client Sample ID :LAY-AOC4-2SD05 Matrix :SOIL SSD7

ANCHORAGE, AK 99518 Chalifui/Comments TEL: (907) 562-2343 FAX: (907) 561-5301

1,1-Dichloropropene	0.030	U	mg/Kg	EPA 8260 (J)-A./	09/10 09/28	KWH
Ethylbenzene	0.030	U	mg/Kg	EPA 8260 ,	09/10 09/28	KWM
Hexachlorobutadiene	0.030	U	mg/Kg	EPA 8260	09/10 09/28	KWH
Isopropylbenzene	0.030	Ü	mg/Kg	EPA 8260	09/10 09/28	KWM
p-Isopropyltoluene	0.030	U	mg/Kg	EPA 8260	09/10 09/28	KWM
Methylene Chloride	0.030	U	mg/Kg	EPA 8260	09/10 09/28	KWM
Napthalene	0.030		mg/Kg	EPA 8260	09/10 09/28	KWM
n-Propylbenzene	0.030	Ü	mg/Kg	EPA 8260	09/10 09/28	KWM
Styrene	0.030	U	mg/Kg	EPA 8260	09/10 09/28	KWM
1112-Tetrachloroethane	0.030	U	mg/Kg	EPA 8260	09/10 09/28	KWM
1122-Tetrachloroethane	0.030	U	mg/Kg	EPA 8260	09/10 09/28	KWM
Tetrachloroethene	0.030	Ū	mg/Kg	EPA 8260	09/10 09/28	KWM
Toluene	0.030	Ū	mg/Kg	EPA 8260	09/10 09/28	KWM
1,2,3-Trichlorobenzene	0.030	Ū	mg/Kg	EPA 8260	09/10 09/28	KWM
1,2,4-Trichlorobenzene	0.030	Ū	mg/Kg	EPA 8260	09/10 09/28	KWM
1,1,1-Trichloroethane	0.030	U	mg/Kg	EPA 8260	09/10 09/28	KWM
1,1,2-Trichloroethane	0.030	U	mg/Kg	EPA 8260	09/10 09/28	KWM
Trichloroethene	0.030	U	mg/Kg	EPA 8260	09/10 09/28	KWM
Trichlorofluoromethane	0.030	U	mg/Kg	EPA 8260	09/10 09/28	KWM
1,2,3-Trichloropropane	0.030	U	mg/Kg	EPA 8260	09/10 09/28	KWM
1,2,4-Trimethylbenzene	0.030	U	mg/Kg	EPA 8260	09/10 09/28	KWM
1,3,5-Trimethylbenzene	0.030	U	mg/Kg	EPA 8260	09/10 09/28	KWM
Vinyl Chloride	0.030	U	mg/Kg	EPA 8260	09/10 09/28	KWM
p+m-Xylene	0.032		mg/Kg	EPA 8260	09/10 09/28	KWM
o-Xylene	0.030	U	mg/Kg	EPA 8260 ₹	09/10 09/28	KWM
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See Special Instructions Above

See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed

LT = Less Than

GT = Greater Than



Member of the SGS Group (Société Générale de Surveillance)



REPORT OF ANALYSIS

ENVIRONMENTAL LABORATORY SERVICES

Chemiab Ref.# :93.4692-7

Client Sample ID :LAY-AOC4-25D06

Matrix

:SOIL 5507

5633 B STREET ****CHORAGE, AK 99518 ***EL: (907) 562-2343

=4X: (907) 561-5301

Client Name Ordered By

:ICF HAISER ENGINEERING :SHERI K ACE

Project Name Project#

:DEW LINE RI/FS :41096-412-01

PWSID :UA WORK Order

:70792

Report Completed :10/01/93 :09/07/93

@ 17:35 hrs

Collected Received

Technical Director: STEPHEN C. EDE

:09/09/93 @ 12:00 hrs

Released By :

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA. EPH PATTERN IS NOT CONSISTENT

WITH MIDDLE DISTILLATE FUEL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	85.7		 %	SM17 2540G			09/10	EAL
Hydrocarpons VFH	0.500	IJ	mg/Kg	TA 5030/8015M		19/10	09/15	HLS
Hydrocarbons 52H	21.7		mg/Kg	3510/3550/8100M			09/20	JBH
1101-411-0			3. 3	,,,		33/14	0 3/ 20	Jan
Volatile Organics				EPA 8260				
Benzene	0.025	ij	mg/Kg	EPA 8260		09/10	09/28	KWM
Bromobenzene	0.025	IJ	mg/Kg	EPA 8260		09/10		KWM
Bromocnloromethane	0.025	U	mg/Kg	EPA 8260		09/10		KWM
Bromodichloromethane	0.025	U	mg/Kg	EPA 8260		09/10		· · · · · · · · · · · · · · · · · · ·
Bromoform	0.025	U	mg/Kg	EPA 8260		09/10		
Bromomethane	0.025	U	mg/Kg	EPA 8260		09/10		KWH
n-Butylbenzene	0.025	Ü	mg/Kg	EPA 8260		09/10		KWM
sec-Butylbenzene	0.025	U	mg/Kg	EPA 8260		09/10		KWM
tert-Butylbenzne	0.025	U	mg/Kg	EPA 8260		09/10		KWM
Carbon Tetrachloride	0.025	U	mg/Kg	EPA 8260		09/10		KWM
Chlorobenzene	0.025	Ü	mg/Kg	EPA 8260		09/10		KWM
Chloroethane	0.025	U	mg/Kg	EPA 8260		09/10		KWM
Chloroform	0.025	IJ	mg/Kg	EPA 8260		09/10		KWH
Chloromethane	0.025	IJ	mg/Kg	EPA 8260		09/10		KWM.
2-Chlorotoluene	0.025	IJ	mg/Kg	EPA 8260		09/10		KWM
4-Chlorotoluene	0.025	U	mg/Kg	EPA 8260		09/10		KWM
Dibromochloromethane	0.025	U	mg/Kg	EPA 8260		09/10		KWM
12Dibromo3Chloropropane	0.025		mg/Kg	EPA 8260		09/10		KWM
1,2-Dibromoethane	0.025		mg/Kg	EPA 8260		09/10		KWM
Dibromomethane	0.025		mg/Kg	EPA 8260		09/10		KWM
1,2-Dichlorobenzene	0.025		mg/Kg	EPA 8260		09/10		KWM
1,3-Dichlorobenzene	0.025		mg/Kg	EPA 8260		09/10		KWM
1,4-Dichlorobenzene	0.025		mg/Kg	EPA 8260		09/10		KWM
Dichlorodifluoromethane	0.025		mg/Kg	EPA 8260		09/10		KWM
1,1-Dichloroethane	0.025		mg/Kg	EPA 8260		09/10		KWM
1,2-Dichloroethane	0.025		mg/Kg	EPA 8260		09/10		KWM
1,1-Dichloroethene	0.025		mg/Kg	EPA 8260		09/10		KWM
cis-1,2-Dichloroethene	0.025		mg/Kg	EPA 8260		09/10		KWM
trans1,2-Dichloroethene	0.025		mg/Kg	EPA 8260		09/10		KWM
1,2-Dichloropropane	0.025		mg/Kg	EPA 8260		09/10		KWM
1,3-Dichloropropane	0.025		mg/Kg	EPA 8260		09/10		KWM
2,2-Dichloropropane	0.025		mg/Kg	EPA 8260		09/10		:\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
	_	-	3,			03/10	0 3/ 20	

ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS nemlab Ref.# :93.4692-7

Client Sample ID :LAY-A0C4-2SD06 Matrix :SOIL SSQ7

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

See Special Instructions Above

See Sample Remarks Above

Undetected, Reported value is the practical quantification limit. Secondary dilution.

UA = Unavailable

NA = Not Analyzed

LT = Less Than GT = Greater Than





REPURT OF ANALYSIS

ENVIRONMENTAL LABORATORY SERVICES

Chemiab Ref.#

:93.4692-8

Client Sample ID :LAY-A064 2SD07 Matrix :SOIL

5533 B STREET 4NCHORAGE, AK 99518 TEL: (907) 562-2343

FAX: (907) 561-5301

Client Name Ordered By

:ICF HAISER ENGINEERING :SHERI K ACE

Project Name Project#

:DEW LINE RI/FS :41096-412-01

PWSID

:UA

WORK Order

Report Completed :10/01/93

:70792

:09/07/93

@ 16:00 hrs

hrs

Collected Received

:09/09/93 @ 12:00 Technical Director: STEPHEN, C. EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA. EPH PATTERN IS NOT CONSISTENT

WITH MIDDLE DISTILLATE FUEL.

 Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	72.5		 }	SM17 2540G				
Hydrocarbons VPH	0.600	ij	ng/Kg	EPA 5030/8015M		20 (10	09/10	
Hydrocarbons EPH	10.8	.,	mg/Kg	3510/3550/8100M			09/15	_
			3/ 1/ 3	3310, 3330, 610011		09/14	09/18	JBH
Volatile Organics				EPA 8260				
Benzene	0.030	บ	∴g/Kg	EPA 8260		09/10	09/28	tirtinu
Bromobenzene	0.030	U	mg/Kg	EPA 8260			09/28	KWH
Bromochloromethane	0.030	Ü	mg/Kg	EPA 8260			09/28	KWM KWM
Bromodichloromethane	0.030	Ü	mg/Kg	EPA 8260			09/28	
Bromoform	0.030	U	mg/Kg	EPA 8260			09/28	WH.
Bromomethane	0.030	U	mg/Kg	EPA 8260			09/28	KWM
n-Butylbenzene	0.030	U	mg/Kg	EPA 8260			09/28	KWH
sec-Butylbenzene	0.030	U	mg/Kg	EPA 8260			09/28	KWM
tert-Butylbenzne	0.030	U	mg/Kg	EPA 8260		09/10		KWM
Carbon Tetrachloride	0.030	Ū	mg/Kg	EPA 8260		09/10		
Chlorobenzene	0.030	Ū	mg/Kg	EPA 8260		09/10		KWM
Chloroethane	0.030	Ü	mg/Kg	EPA 8260				KWH
Chloroform	0.030	Ü	mg/Kg	EPA 8260		09/10		KWM
Chloromethane	0.030	Ü	mg/Kg	EPA 8260		09/10		KWM
2-Chlorotoluene	0.030	Ü	mg/Kg	EPA 8260		09/10		KWM
4-Chlorotoluene	0.030	Ü	mg/Kg	EPA 8260		09/10		KWH
Dibromochloromethane	0.030	11	mg/Kg	EPA 8260		09/10		KWH
12Dibromo3Chloropropane	0.030	Ü	mg/Kg	EPA 8260		09/10		KWM
1,2-Dibromoethane	0.030	Ü	mg/Kg	EPA 8260		09/10		KWM
Dibromomethane	0.030	Ü	mg/Kg	EPA 8260		09/10		KWM
1,2-Dichlorobenzene	0.030	Ü	mg/Kg	EPA 8260		09/10		KWH
1,3-Dichlorobenzene	0.030	Ŭ	mg/Kg	EPA 8260		09/10		KWM
1,4-Dichlorobenzene	0.030	Ü	mg/Kg	EPA 8260		09/10		KWM
Dichlorodifluoromethane	0.030	Ü	mg/Kg	EPA 8260		09/10		KWM
1,1-Dichloroethane	0.030	-	mg/Kg	EPA 8260		09/10		KWM
1,2-Dichloroethane	0.030	_	mg/Kg	EPA 8260		09/10		KWM
1,1-Dichloroethene	0.030	_	mg/Kg	EPA 8260		09/10		KWM
cis-1,2-Dichloroethene	0.030	_	mg/Kg	EPA 8260		09/10		KWM
trans1,2-Dichloroethene	0.030		mg/Kg	EPA 8260		09/10		KWM
1,2-Dichloropropane	0.030	-	mg/Kg	EPA 8260		09/10		KWM
1,3-Dichloropropane	0.030	•	mg/Kg	EPA 8260		09/10		KWM
2,2-Dichloropropane	0.030	_	mg/Kg	EPA 8260		09/10		KWM
· -		-	3/ 119	LA 0200		09/10	U 7 / Z O	M





ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.#

:93.4692-8

Client Sample ID :LAY-A0C4 2SD07 Matrix :SOIL SSOT

REPORT of ANALYSIS

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343

1 1-Dichle				FAX: (907) 56	1-5301
1,1-Dichloropropene Ethylbenzene Hexachlorobutadiene Isopropylbenzene p-Isopropyltoluene Methylene Chloride Napthalene n-Propylbenzene Styrene 1112-Tetrachloroethane 1122-Tetrachloroethane Tetrachloroethene Toluene 1,2,3-Trichlorobenzene 1,1,1-Trichlorobenzene 1,1,2-Trichloroethane Trichloroethane 1,1,2-Trichloroethane 1,1,2-Trichloropropane 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene Vinyl Chloride p+m-Xylene 0-Xylene	0.030 U 0.030 U	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	EPA 8260 EPA 8260	09/10 09/28 09/10 09/28	KMH KMH KMH KMH KMH KMH KMH KMH
				/ 0 // 20	KWM

See Special Instructions Above

See Sample Remarks Above

Undetected, Reported value is the practical quantification limit. Secondary dilution.

UA = Unavailable

NA = Not Analyzed

LT = Less Than

GT = Greater Than



SSS Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

:93.4356-7 Chemlab Ref.# Client Sample ID :LAY-AOC4-SW02 Matrix

:WATER SSØ7

5633 B STREET ANCHORAGE. AK 99518 TEL: (907) 562-2343

FAX: (907) 561-5301

Client Name Ordered By

:ICF KAISER ENGINEERING

:RAY MORRIS

Project Name Project# PWSID

:DEW LINE RI/FS :41096-412-01

:UA

WORK Order :70116

Report Completed :10/06/93

:08/24/93 Collected @ 12:52 hrs. :08/26/93 @ 12:00 hrs. Received

Technical Director:STEPHEN EDE

Released By : Line

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON.

 Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.0010	Ü	mg/L	EPA 8260		09/02	09/02	MCM
Bromobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromodichloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromoform	0.0010	Ü	mg/L	EPA 8260		09/02	09/02	MCM
Bromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	HCM
sec-Butylbenzene	0.0010	Ŭ	mg/L	EPA 8260		09/02	09/02	MCM_
tert-Butylbenzne	0.0010	U	mg/L	EPA 8260			09/02	MÇ
Carbon Tetrachloride	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC
Chlorobenzene	0.0010	Ü	mg/L	EPA 8260		09/02	09/02	HCM
Chloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloroform	0.0010	บ	mg/L	EPA 8260			09/02	MCM
Chloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
2-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dibromochloromethane	0.0010	ប	mg/L	EPA 8260		09/02	09/02	MCM
12Dibromo3Chloropropane	0.0010	U	mg/L	EPA 8260			09/02	MCM
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	HCM
Dibromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	HCM
1,2-Dichlorobenzene	0.0010	Ü	mg/L	EPA 8260		09/02	09/02	MCM
1,3-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	HCM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dichlorodifluoromethane	0.0010	Ü	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260			09/02	HCM
1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02		MCM
cis-1,2-Dichloroethene	0.0075		mg/L	EPA 8260			09/02	MCM
trans1,2-Dichloroethene	0.0021		mg/L	EPA 8260		09/02		MCM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260			09/02	MCM
1,3-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02		MCM
2,2-Dichloropropane	0.0010	Ū.	mg/L	EPA 8260		09/02		MCM
1,1-Dichloropropene	0.0010	U	mg/L	EPA 8260		09/02		HCM
Ethylbenzene	0.0010	U	mg/L	EPA 8260		09/02		HCM
Hexachlorobutadiene	0.0010	U	mg/L	EPA 8260		09/02		MCM
Isopropylbenzene	0.0010	บ	mg/L	EPA 8260		09/02		MCM
p-Isopropyltoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MC

A Part

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS 5633 B STREET Chemilab Ref.# :93.4356-7 ANCHORAGE, AK 99518 Client Sample ID :LAY-AOC4-SW02 Matrix :WATER ^{SSQ7+} TEL: (907) 562-2343 FAX: (907) 561-5301 Methylene Chloride 0.0010 09/02 09/02 mg/L EPA 8260 MCM Napthalene 0.0010 U 09/02 09/02 mg/L EPA 8260 MCM n-Propylbenzene 0.0010 U mg/L EPA 8260 09/02 09/02 MCM Styrene 0.0010 U mg/L EPA 8260 09/02 09/02 MCM 1112-Tetrachloroethane 0.0010 U mq/L EPA 8260 09/02 09/02 MCM 1122-Tetrachloroethane 0.0010 U mg/L EPA 8260 09/02 09/02 MCM Tetrachloroethene 0.0010 U mq/L EPA 8260 09/02 09/02 MCM Toluene 0.0010 U EPA 8260 mg/L 09/02 09/02 MCM 1,2,3-Trichlorobenzene 0.0013 mg/L EPA 8260 09/02 09/02 MCM 1,2,4-Trichlorobenzene 0.0010 mg/L EPA 8260 09/02 09/02 MCM 1,1,1-Trichloroethane 0.0010 U mg/L EPA 8260 09/02 09/02 MCM 1,1,2-Trichloroethane 0.0010 U EPA 8260 mg/L 09/02 09/02 MCM Trichloroethene 0.0039 mq/L EPA 8260 09/02 09/02 MCM Trichlorofluoromethane 0.0010 U EPA 8260 09/02 09/02 mg/L MCM 1,2,3-Trichloropropane 0.0010 H EPA 8260 mg/L 09/02 09/02 MCM 1,2,4-Trimethylbenzene 0.0010 U mg/L EPA 8260 09/02 09/02 MCM 1,3,5-Trimethylbenzene 0.0010 U mq/L EPA 8260 09/02 09/02 MCM Vinyl Chloride 0.0010 U mg/L EPA 8260 09/02 09/02 MCM p+m-Xylene 0.0010 U mg/L EPA 8260 09/02 09/02 MCM o-Xylene 0.0010 U mg/L EPA 8260 09/02 09/02 **MCM** Semivolatile Organics **EPA** 8270 Phenol 0.019 U mg/L EPA 8270 08/31 09/10 MTT (2-Chloroethyl)ether 0.019 U mg/L EPA 8270 08/31 09/10 MTT Chlorophenol 0.019 U EPA 8270 mg/L 08/31 09/10 MTT 1.3-Dichlorobenzene 0.019 U mg/L **EPA** 8270 08/31 09/10 MTT 1,4-Dichlorobenzene 0.019 U EPA 8270 mg/L 08/31 09/10 MTT Benzyl Alcohol 0.019 U mg/L EPA 8270 08/31 09/10 MTT 1,2-Dichlorobenzene 0.019 U mg/L EPA 8270 08/31 09/10 MTT 2-Methylphenol 0.019 U EPA 8270 08/31 09/10 mg/L MTT bis(2-Chloroisopropyl)e 0.019 U ma/L EPA 8270 08/31 09/10 MTT 4-Methylphenol 0.019 U EPA 8270 ma/L 08/31 09/10 HTT n-Nitroso-di-n-Propylam 0.019 U EPA 8270 mg/L 08/31 09/10 MIT Hexachloroethane 0.019 U mg/L EPA 8270 08/31 09/10 HTT Nitrobenzene 0.019 U EPA 8270 mg/L 08/31 09/10 MTT Isophorone 0.019 U **EPA** 8270 mg/L 08/31 09/10 MTT 2-Nitrophenol 0.019 U mg/L EPA 8270 08/31 09/10 MTT 2,4-Dimethylphenol 0.019 U mg/L **EPA** 8270 08/31 09/10 MTT Benzoic Acid 0.019 U EPA 8270 mg/L 08/31 09/10 MTT bis(2-Chloroethoxy)Meth 0.019 u mg/L **EPA** 8270 08/31 09/10 MIT 2,4-Dichlorophenol 0.019 U **EPA** 8270 mg/L 08/31 09/10 MTT 1,2,4-Trichlorobenzene 0.019 U mg/L **EPA** 8270 08/31 09/10 MTT Naphthalene 0.019 U mg/L EPA 8270 08/31 09/10 MTT 4-Chloroaniline 0.019 U mg/L **EPA** 8270 08/31 09/10 MTT Hexachlorobutadiene 0.019 U mg/L EPA 8270 08/31 09/10 MIT 4-Chloro-3-Methylphenol 0.019 U mg/L **EPA** 8270 08/31 09/10 MTT 2-Methylnaphthalene 0.019 U mq/L EPA 8270 08/31 09/10 MTT Hexachlorocyclopentadie 0.019 U 08/31 09/10 mq/L EPA 8270 MTT 2,4,6-Trichlorophenol 0.019 U mg/L **EPA** 8270 08/31 09/10 MTT 2,4,5-Trichlorophenol 0.019 U **EPA** 8270 mg/L 08/31 09/10 MTT 2-Chloronaphthalene 0.019 mg/L EPA 8270 08/31 09/10 MTT





ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS 5633 B STREET Chemlab Ref.# :93.4356-7 ANCHORAGE, AK 99518 Client Sample ID :LAY-AOC4-SW02 TEL: (907) 562-2343 :WATER SSOT Matrix FAX: (907) 561-5301 2-Nitroaniline 0.019 U mg/L EPA 8270 08/31 09/10 MTT Dimethylphthalate 0.019 08/31 09/10 Ü mq/L EPA 8270 MTT Acenaphthylene 0.019 U mq/L EPA 8270 08/31 09/10 MTT 2.6-Dinitrotoluene 0.019 U ma/L EPA 8270 08/31 09/10 MTT 3-Nitroaniline 0.019 U mg/L EPA 8270 08/31 09/10 MTT Acenaphthene 0.019 U EPA 8270 08/31 09/10 mg/L MTT 2,4-Dinitrophenol 0.019 U EPA 8270 08/31 09/10 mg/L MTT 4-Nitrophenol 0.019 U EPA 8270 08/31 09/10 mg/L MIT Dibenzofuran 0.019 U 08/31 09/10 mg/L EPA 8270 MTT 2,4-Dinitrotoluene 0.019 U EPA 8270 08/31 09/10 mq/L MTT Diethylphthalate 0.019 IJ MTT ma/L EPA 8270 08/31 09/10 4-Chlorophenyl-Phenylet 08/31 09/10 0.019 U mq/L EPA 8270 MTT Fluorene 0.019 08/31 09/10 U mq/L **EPA** 8270 MTT 4-Nitroaniline 0.019 U mq/L **EPA** 8270 08/31 09/10 MTT 4,6-Dinitro-2-Methylphe 0.019 U mq/L **EPA** 8270 08/31 09/10 MTT n-Nitrosodiphenylamine 0.019 U EPA 8270 08/31 09/10 MTT mg/L 4-Bromophenyl-Phenyleth 0.019 П **EPA** 8270 08/31 09/10 mg/L MTT Hexachlorobenzene 0.019 U mg/L EPA 8270 08/31 09/10 MTT Pentachlorophenol 0.019 U EPA 8270 08/31 09/10 mg/L MTT Phenanthrene 0.019 U mg/L EPA 8270 08/31 09/10 MTT Anthracene 0.019 U mq/L **EPA** 8270 08/31 09/10 MTT di-n-Butylphthalate 0.019 U ma/L EPA 8270 08/31 09/10 MTT Fluoranthene 0.019 U mg/L EPA 8270 08/31 09/10 MI Pyrene 0.019 U EPA 8270 08/31 09/10 mg/L MTI Butylbenzylphthalate 0.019 U **EPA** 8270 08/31 09/10 mg/L MIT 3,3-Dichlorobenzidine 0.019 U 08/31 09/10 EPA 8270 mq/L MTT Benzo(a)Anthracene 0.019 U EPA 8270 08/31 09/10 MTT mg/L Chrysene 0.019 08/31 09/10 U EPA 8270 mg/L MTT bis(2-Ethylhexyl)Phthal 0.019 08/31 09/10 U mg/L **EPA** 8270 MTT di-n-Octylphthalate 0.019 08/31 09/10 U mq/L **EPA** 8270 MTT Benzo(b)Fluoranthene 0.019 U **EPA** 8270 08/31 09/10 ma/L MIT Benzo(k)Fluoranthene 0.019 08/31 09/10 U EPA 8270 MTT ma/L Benzo(a)Pyrene 0.019 U EPA 8270 08/31 09/10 MTT mg/L Indeno(1,2,3-cd)Pyrene 0.019 U 08/31 09/10 **EPA** 8270 MTT mg/L Dibenz(a,h)Anthracene 0.019 U 08/31 09/10 EPA 8270 MTT mq/L Benzo(g,h,i)Perylene 0.019 EPA 8270 08/31 09/10 MTT mg/L TOC, Nonpurgable EPA 9060 n/a ...TOC Range 14.7-16.0 mg/L EPA 9060 09/07 CMR ...TOC Concentration 15.5 EPA 9060 09/07 CMR mg/L

Residue, Non-Filterable

Residue, Filterable (TDS)

28

1976

UA = Unavailable

NA = Not Analyzed

08/30 08/31

09/01 09/02

500

GPP

RJK

LT = Less Than

GT = Greater Than



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EPA 160.2

EPA 160.1

mg/L

mg/L

See Special Instructions Above

See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.



ENVIRONMENTAL LABORATORY SERVICES

Chemiab Ref.# :93.4692-1

Client Sample ID :LAY-AOC4-25W04

Matrix

:WATER SSØ7

REPORT of ANALYSIS

5633 B STREET ANCHORAGE, AK 99513

TEL: (907) 562-2343 FAX: (907) 561-5301

Client Name

:ICF KAISER ENGINEERING

Ordered By Project Name Project#

:SHERI K ACE :DEW LINE RI/FS :41096-412-01

PWSID

: UA

WORK Order

Received

:70792

Report Completed :10/01/93 Collected

:09/07/93 @ 16:00 hrs :09/09/93 @ 12:00 hrs

Technical Director: STEPHEN ,C. EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA. EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL. **THESE COMPOUNDS WERE NOT CALIBRATED FOR AT THE TIME. SAMPLE HAD TO BE RUN FOR 8260 SO HOLDING TIMES WOULD NOT BE EKCEEDED. 3 = THIS FLAG IS USED WHEN THE ANALYTE IS FOUND IN THE

ASSOCIATED BLANK AS WELL AS IN THE SAMPLE.

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	Parameter	Results	Qual	Units	Method	Allowable Limits	Ext. Date	Anal Da te	Init
	Hydrocarbons VPH	0.189		mg/L	EPA 5030/8015M				
	Hydrocarbons EPH	0.961		mg/L	3510/3550/8100M			09/13 09/15	WLS JBH
	Volatile Organics						V 37 13	0 3/ 13	JBN
	Benzene	0.0017		mg/L	EPA 8260				
	Bromobenzene	0.0010	Ū	mg/L	EPA 8260 EPA 8260		09/20	09/20	KWM
f	Bromochloromethane	0.0010	Ü	mg/L	EPA 8260			09/20	KWM
	Bromodichloromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWH
	Bromoform Bromomethane	0.0010	Ü	mg/L	EPA 8260			09/20	KWM
	n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20 09/20	KWM
	sec-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
	tert-Butylbenzne	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM KWM
	Carbon Tetrachloride	0.0010	U	mg/L	EPA 8260		09/20		KWM
	Chlorobenzene	0.0010	Ü	mg/L	EPA 8260		09/20		KWM
	Chloroethane	0.0010 0.0010	Ü	mg/L	EPA 8260		09/20		KWM
	Chloroform	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
	Chloromethane	0.0032	В	mg/L	EPA 8260		09/20	09/20	KWM
	2-Chlorotoluene	0.0010	U	mg/L mg/L	EPA 8260		09/20		KWM
	4-Chlorotoluene	0.0010	Ŭ	mg/L	EPA 8260		09/20		KWM
	Dibromochloromethane	0.0010	Ü	mg/L	EPA 8260 EPA 8260		09/20	09/20	KWM
	12Dibromo3Chloropropane	**	J	mg/L	EPA 8260		09/20	09/20	KWM
	1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		00.420		
	Dibromomethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
	1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/20 09/20	09/20	KWM
	1,3-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
	Dichlorodifluoromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM KWM
	1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/20		KWM
	1,2-Dichloroethane	0.0010	Ŭ	mg/L	EPA 8260		09/20		KWM
	1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/20		KWM
	cis-1,2-Dichloroethene	0.0023	_	mg/L	EPA 8260		09/20		KWM
	trans1,2-Dichloroethene	0.178	D	mg/L	EPA 8260		09/20		KWM
	1,2-Dichloropropane	0.0036 0.0010	11	mg/L	EPA 8260		09/20		KWM
À		0.0010	U	mg/L	EPA 8260		09/20		KWM
•									



ENVIRONMENTAL LABORATORY SERVICES



5 N.Z.E 1928		REPO	ORT of ANA	M.YSTS				
Chemlab Ref. # :93.4692-1		'	va run				5633 B STREET	_
Client Sample ID :LAY-AOC4-	2SW04						ORAGE, AK 99518 EL: (907) 562-2343	
Matrix :WATER SEGT							AX: (907) 561-5301	
1 2 55-61								
1,3-Dichloropropane	0.0010	U	mg/L	EPA	8260	09/20	09/20 KW	WM
2,2-Dichloropropane	0.0010	Ü	mg/L		8260			WM
1,1-Dichloropropene	0.0010	U	mg/L		8260			WM.
Ethylbenzene	0.0010	U	mg/L		8260		09/20 KW	
Hexachlorobutadiene	**		mg/L		8260	0 3, 20	03/20 AH	461
Isopropylbenzene	0.0010	Ü	mg/L		8260	09/20	09/20 KW	JM.
p-Isopropyltoluene	0.0010	U	mg/L		8260	09/20		
Methylene Chloride	0.0010	U	mg/L		8260	09/20		
Napthalene	**	Ü	mg/L		8260	09/20		
n-Propylbenzene	0.0010	U	mg/L		8260	09/20		
Styrene	0.0010	IJ	mg/L		8260	09/20		
1112-Tetrachloroethane	0.0010	U	mg/L		8260	09/20		
1122-Tetrachloroethane	0.0010	U	mg/L		8260	09/20		
Tetrachloroethene	0.0010	U	mg/L		8260	09/20		
Toluene	0.0010	IJ	mg/L		8260	09/20	,	
1,2,3-Trichlorobenzene	**		mg/L		8260	37,20	03/20 :\#	111
1,2,4-Trichlorobenzene	**		mg/L		8260			
1,1,1-Trichloroethane	0.0010	IJ	mg/L		8260	09/20	09/20 KW	7M
1,1,2-Trichloroethane	0.0010	U	mg/L	EPA	8260	09/20		
Trichloroethene	0.068	D	mg/L	EPA	8260	09/20		
Trichlorofluoromethane	0.0010	U	mg/L	EPA	8260	09/20		
1,2,3-Trichloropropane	0.0010	IJ	mg/L		8260	09/20		
1,2,4-Trimethylbenzene	0.0010	U	mg/L	EPA	8260	09/20		
1,3,5-Trimethylbenzene	0.0010	U	mg/L	EPA	8260	09/20		М
Vinyl Chloride	0.0010	U	mg/L	EPA	8260	09/20		
p+m-Xylene	0.0010	Ü	mg/L		8260	09/20		
o-Xylene	0.0010	Ü	mg/L		8260	09/20		
						00, 20	, ICHI	••

** See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit. D = Secondary dilution.

UA = Unavailable NA = Not Analyzed

LT = Less Than

GT = Greater Than



Member of the SGS Group (Société Générale de Surveillance)

^{*} See Special Instructions Above



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4692-2 Client Sample ID :LAY-A0C4-25W04 SPIKE

Matrix

: WATER SSØ7

BMF 12.695

Client Name Ordered By Project Name

Project#

PWSID

:ICF KAISER ENGINEERING :SHERI K ACE

:DEW LINE RI/FS :41096-412-01

:UA

WORK Order

:70792 Report Completed :10/01/93

Collected Received

:09/07/93 @ 16:00 hrs :09/09/93 @ 12:00 hrs

5633 B STREET ANCHORAGE, AK 99518

TEL: (907) 562-2343

FAX: (907) 551-5301

Technical Director: STEPHEN, C. EDE Released By :

Honesto Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA. FOR EPH AND 8260 VPH SEAKE AND SPIKE DUPLICATE RECOVERY AND RPD, SEE QC SUMMARY. **THESE COMPOUNDS WERE NOT CALIBRATED FOR AT THE TIME. SAMPLE HAD TO BE RUN FOR 8260 SO HOLDING TIMES WOULD NOT BE EXCEEDED.

QC Allowable Ext. Anal Parameter Results Qual Units Method Limits Date Date Init Hydrocarbons VPH 0.714 mq/L EPA 5030/8015M 09/13 09/13 WLS Hydrocarbons EPH 15.8 3510/3550/8100M mg/L 09/13 09/15 JBH Volatile Organics EPA 8260 Benzene 0.092 D mg/L EPA 8260 09/20 09/20 Bromobenzene KWM 0.010 U EPA 8260 mq/L 09/20 09/20 Bromochloromethane KWM 0.010 U mg/L EPA 8260 09/20 09/20 KWM Bromodichloromethane 0.010 U mg/L EPA 8260 09/20 09/20 Bromoform KWM 0.010 U mg/L EPA 8260 09/20 09/20 Bromomethane KWM 0.010 U mg/L EPA 8260 09/20 09/20 n-Butylbenzene KWM 0.010 11 mg/L EPA 8260 09/20 09/20 KWM sec-Butylbenzene 0.010 H mg/L EPA 8260 09/20 09/20 tert-Butylbenzne KWM 0.010 U mg/L EPA 8260 09/20 09/20 KWM Carbon Tetrachloride 0.010 11 mg/L EPA 8260 09/20 09/20 Chlorobenzene KWM 0.092 D EPA 8260 mg/L 09/20 09/20 KWM Chloroethane 0.010 U mg/L EPA 8260 09/20 09/20 Chloroform KWM 0.010 U EPA 8260 mg/L 09/20 09/20 Chloromethane KWM 0.010 U mq/L EPA 8260 09/20 09/20 2-Chlorotoluene KWH 0.010 U EPA 8260 mg/L 09/20 09/20 4-Chlorotoluene KWM 0.010 U EPA 8260 mg/L 09/20 09/20 Dibromochloromethane KWM 0.010 mg/L EPA 8260 09/20 09/20 12Dibromo3Chloropropane KWM mq/L EPA 8260 1,2-Dibromoethane 0.010 U mg/L EPA 8260 09/20 09/20 KWM Dibromomethane 0.010 U mg/L EPA 8260 09/20 09/20 KWH 1,2-Dichlorobenzene 0.010 U mg/L EPA 8260 09/20 09/20 KWM 1,3-Dichlorobenzene 0.010 U mg/L EPA 8260 09/20 09/20 KWM 1,4-Dichlorobenzene 0.010 mg/L EPA 8260 09/20 09/20 KWM Dichlorodifluoromethane 0.010 mg/L EPA 8260 09/20 09/20 KWM 1,1-Dichloroethane 0.010 U mg/L EPA 8260 09/20 09/20 KWM 1,2-Dichloroethane 0.010 mg/L EPA 8260 09/20 09/20 KWM 1,1-Dichloroethene 0.104 D mg/L EPA 8260 09/20 09/20 KWM cis-1,2-Dichloroethene 0.168 D mg/L EPA 8260 09/20 09/20 KWM trans1,2-Dichloroethene 0.010 U mg/L EPA 8260 09/20 09/20 1,2-Dichloropropane KWM 0.010 [] mg/L EPA 8260 09/20 09/20 KWM 1,3-Dichloropropane 0.010 U mg/L EPA 8260 09/20 09/20 KWM



Chemlab Ref.#

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4692-2
Client Sample ID : 1AY-1004-25W04 SDIVE

5633 B S7 ANCHORAGE, AK 99518

Matrix :WATER	C1 -2SW04 SPIK	Ξ			TEL: (907) 562-2343
Matrix :WATER	2207				FAX: (907) 561-5301
	8mf 12695				
2,2-Dichloropropane	0.010	Ü	mg/L	EPA 8260	09/20 09/20 KWI
1,1-Dichloropropene	0.010	Ü	mg/L	EPA 8260	09/20 09/20 KWI
Ethylbenzene	0.010	U	mg/L	EPA 8260	09/20 09/20 KWM
Hexachlorobutadiene	**		mg/L	EPA 8260	03/20 03/20 RMI.
Isopropylbenzene	0.010	U	mg/L	EPA 8260	09/20 09/20 KWM
p-Isopropyltoluene	0.010	Ü	mg/L	EPA 8260	09/20 09/20 KWM
Methylene Chloride	0.010	Ü	mg/L	EPA 8260	09/20 09/20 KWM
Napthalene	**	•	mg/L	EPA 8260	09/20 09/20 KMN
n-Propylbenzene	0.010	U	mg/L	EPA 8260	09/20 09/20 KWM
Styrene	0.010	Ü	mg/L	EPA 8260	
1112-Tetrachloroethane	0.010	U	_		09/20 09/20 KWM
1122-Tetrachloroetrane	0.010	Ü	mg/L	EPA 8260	09/20 09/20 KWM
Tetrachloroethene		_	mg/L	EPA 8260	09/20 09/20 KWM
Toluene	0.010	Ŋ	mg/L	EPA 8260	09/20 09/20 KWM
1,2,3-Trichlorobenzene	0.100	D	mg/L	EPA 8260	09/20 09/20 KWH
1,2,4-Trichlorobenzene	**		mg/L	EPA 8260	
			mg/L	EPA 8260	
1,1,1-Trichloroethane	0.010	U	mg/L	EPA 8260	09/20 09/20 KWM
1,1,2-Trichloroethane	0.010	Ü	mg/L	EPA 8260	09/20 09/20 KWH
Trichloroethene	0.149	D	mg/L	EPA 8260	09/20 09/20 KWM
Trichlorofluoromethane	0.010	Ü	mg/L	EPA 8260	09/20 09/20 KWM
1,2,3-Trichloropropane	0.010	U	mg/L	EPA 8260	09/20 09/20 KWM
1,2,4-Trimethylbenzene	0.010	U	mg/L	EPA 8260	09/20 09/20 KWM
1,3,5-Trimethylbenzene	0.010	U	mg/L	EPA 8260	09/20 09/20 ANH
Vinyl Chloride	0.010	U	mg/L	EPA 8260	09/20 09/20 MM
p+m-Xylene	0.010	U	mg/L	EPA 8260	09/20 09/20 KWM
o-Xylene	0.010	U	mg/L	EPA 8260	09/20 09/20 KWM

See Special Instructions Above

** See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed LT = Less Than

GT = Greater Than





ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.#

REPORT of ANALYSIS

TEL: (907) 562-2343 FAX: (907) 561-5301

Matrix

Client Sample ID :LAY-AOC4-2SW04 SPIKE DUPLICATE

ANCHORAGE, AK 99518

5633 B STREET

:WATER SSOF

:93.4692-3

8m€126.95

:ICF KAISER ENGINEERING

:SHERI K ACE

Collected

:10/01/93 :09/07/93

Project Name Project#

Client Name

Ordered By

:DEW LINE RI/FS :41096-412-01

Received

@ 16:00 hrs :09/09/93 @ 12:00 hrs

PWSID :UA

WORK Order

Released By :

Report Completed

Technical Director: STEPHEN, C. EDE

:70792

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA. FOR EPH AND 8260 VPH SPIKE AND SPIKE DUPLICATE RECOVERY AND RPD, SEE QC SUMMARY. **THESE COMPOUNDS WERE NOT CALIBRATED FOR AT THE TIME. SAMPLE HAD TO BE RUN FOR 8260

SO HOLDING TIMES WOULD NOT BE EXCEEDED.

	Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
	Hydrocarbons VPH	0.679		mg/L	EPA 5030/8015M		4 3m	108/13	₹
	Hydrocarbons EPH	16.2		mg/L	3510/3550/8100M		00/13	0 2 713 09/13	
					3320/3330/010011		09/13	09/13	JBH
	Volatile Organics				EPA 8260				
	Benzene	0.093	D	mg/L	EPA 8260		09/20	09/20	KWH
	Bromobenzene	0.010	U	mg/L	EPA 8260			09/20	KWM
_	Bromochloromethane	0.010	U	mg/L	EPA 8260			09/20	KWM
	Bromodichloromethane	0.010	U	mg/L	EPA 8260			09/20	KWM
	Bromoform	0.010	U	mg/L	EPA 8260			09/20	KWH
	Bromomethane	0.010	U	mg/L	EPA 8260			09/20	KWH
	n-Butylbenzene	0.010	U	mg/L	EPA 8260			09/20	KWM
	sec-Butylbenzene	0.010	U	mg/L	EPA 8260			09/20	KWM
	tert-Butylbenzne	0.010	U	mg/L	EPA 8260			09/20	KWM
	Carbon Tetrachloride	0.010	U	mg/L	EPA 8260			09/20	KWM
	Chlorobenzene	0.096	D	mg/L	EPA 8260			09/20	KWM
	Chloroethane	0.010	U	mg/L	EPA 8260			09/20	KWM
	Chloroform	0.010	Ü	mg/L	EPA 8260			09/20	KWM
	Chloromethane	0.010	U	mg/L	EPA 8260			09/20	KWM
	2-Chlorotoluene	0.010	U	mg/L	EPA 8260			09/20	KWM
	4-Chlorotoluene	0.010	U	mg/L	EPA 8260		09/20		KWM
	Dibromochloromethane	0.010	Ü	mg/L	EPA 8260		09/20		KWM
	12Dibromo3Chloropropane	**		mg/L	EPA 8260		03/20	0 37 20	VHU
	1,2-Dibromoethane	0.010	U	mg/L	EPA 8260		09/20	09/20	KWM
	Dibromomethane	0.010	U	mg/L	EPA 8260		09/20		KWM
	1,2-Dichlorobenzene	0.010	Ü	mg/L	EPA 8260		09/20		KWM
	1,3-Dichlorobenzene	0.010	U	mg/L	EPA 8260		09/20		KWM
	1,4-Dichlorobenzene	0.010	Ü	mg/L	EPA 8260		09/20		KWM
	Dichlorodifluoromethane	0.010	Ü	mg/L	EPA 8260		09/20		KWM
	1,1-Dichloroethane	0.010	U	mg/L	EPA 8260		09/20		KWM
	1,2-Dichloroethane	0.010	U	mg/L	EPA 8260		09/20		KWM
	1,1-Dichloroethene	0.112	D	mg/L	EPA 8260		09/20		KWM
	cis-1,2-Dichloroethene	0.160	D	mg/L	EPA 8260		09/20		KWM
	trans1,2-Dichloroethene	0.010	U	mg/L	EPA 8260		09/20		KWM
	1,2-Dichloropropane	0.010	Ü	mg/L	EPA 8260		09/20		KWM
_	1,3-Dichloropropane	0.010	U	mg/L	EPA 8260		09/20		KWH
		•		-	== · · · - = · ·		03,20	0 3/ 20	1/411



p+m-Xylene

o-Xylene

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS Chemlab Ref.# 5633 B ST :93.4692-3 ANCHORAGE, AK 99518 Client Sample ID :LAY-A0C4-2SW04 SPIKE DUPLICATE TEL: (907) 562-2343 Matrix :WATER SSOF FAX: (907) 561-5301 2,2-Dichloropropane 0.010 U mq/L EPA 8260 09/20 09/20 KWI 1,1-Dichloropropene 0.010 U mg/L EPA 8260 09/20 09/20 KWŁ Ethylbenzene 0.010 U mg/L EPA 8260 09/20 09/20 KWI Hexachlorobutadiene mq/L EPA 8260 Isopropylbenzene 0.010 U mq/L EPA 8260 09/20 09/20 KWP p-Isopropyltoluene 0.010 U mq/L EPA 8260 09/20 09/20 KWI Methylene Chloride 0.010 mg/L EPA 8260 09/20 09/20 KWP Napthalene mg/L EPA 8260 n-Propylbenzene 0.010 U mg/L EPA 8260 09/20 09/20 KWE Styrene 0.010 U mg/L EPA 8260 09/20 09/20 KWM 1112-Tetrachloroethane 0.010 mg/L EPA 8260 09/20 09/20 KWE 1122-Tetrachloroethane 0.010 mg/L EPA 8260 09/20 09/20 KWH Tetrachloroethene 0.010 IJ mg/L EPA 8260 09/20 09/20 KWH Toluene 0.100 D mq/L EPA 8260 09/20 09/20 KWM 1,2,3-Trichlorobenzene ** mg/L EPA 8260 1,2,4-Trichlorobenzene mg/L EPA 8260 1,1,1-Trichloroethane 0.010 mg/L EPA 8260 09/20 09/20 KWM 1,1,2-Trichloroethane 0.010 EPA 8260 U mg/L 09/20 09/20 KWM Trichloroethene 0.153 D mg/L EPA 8260 09/20 09/20 KWM Trichlorofluoromethane 0.010 U mg/L EPA 8260 09/20 09/20 KWM 1,2,3-Trichloropropane 0.010 U mg/L EPA 8260 09/20 09/20 KWM 1,2,4-Trimethylbenzene 0.010 U mq/L EPA 8260 09/20 09/20 KWM 1,3,5-Trimethylbenzene 0.010 U mg/L EPA 8260 09/20 09/20 Vinyl Chloride 0.010 U ma/L EPA 8260 09/20 09/20

EPA 8260

EPA 8260

** See Sample Remarks Above

0.010

0.010

U

mq/L

mg/L

D = Secondary dilution.

UA = Unavailable NA = Not Analyzed

09/20 09/20

09/20 09/20

KWM

KWM

LT = Less Than

GT = Greater Than



^{*} See Special Instructions Above UA = Unavailable

U = Undetected, Reported value is the practical quantification limit.



ENVIRONMENTAL LABORATORY SERVICES

Chemiab Ref. # :93.4692-4

Client Sample ID :LAY-AQC4-2SW05

Matrix

:WATERSS#7

REPORT of ANALYSIS

5633 B STREET ANCHORAGE, AK 99518

TEL: (907) 562-2343 FAX: (907) 561-5301

Client Name Ordered By

:ICF HAISER ENGINEERING

Project Name Project#

:SHERI K ACE :DEW LINE RI/FS :41096-412-01

PWSID :UA WORK Order :70792

Report Completed

Received

:10/01/93 Collected :09/07/93

@ 17:20 hrs :09/09/93 @ 12:00 hrs

Technical Director: STEPHEN C. EDE

Released By :

mester Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA.**THESE COMPOUNDS WERE NOT CALIBRATED FOR AT THE TIME. SAMPLE HAD TO BE RUN FOR 8260 SO HOLDING TIMES WOULD

NOT BE EXCEEDED. B = THIS FLAG IS USED WHEN THE ANALYTE IS FOUND IN

THE ASSOCIATED BLANK AS WELL AS IN THE SAMPLE.

Parameter	Results	Qual QC	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Hydrocarbons VPH	0.020	: :	mg/L	EPA 5030/8015M				
Hydrocarbons EPH	0.150	Ü	mg/L	3510/3550/8100M		09/13	09/13 09/15	WLS
Volatile Organics			-			0 3/ 13	09/15	JBH
Benzene				EPA 8260				
Bromobenzene	0.0010	Ü	mg/L	EPA 8260		09/20	09/20	KWM
Bromochloromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromodichloromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Bromoform	0.0010	U	mg/L	EPA 8260			09/20	KWM
Bromomethane	0.0010	U	mg/L	EPA 8260			09/20	KWH
n-Butylbenzene	0.0010	Ū	mg/L	EPA 8260		09/20	09/20	KWM
sec-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
tert-Butylbenzne	0.0010	U	mg/L	EPA 8260		09/20		KWM
Carbon Tetrachloride	0.0010	Ü	mg/L	EPA 8260		09/20		KWM
Chlorobenzene	0.0010	Ü	mg/L	EPA 8260		09/20	09/20	KWM
Chloroethane	0.0010	U	mg/L	EPA 8260		09/20		KWM
Chloroform	0.0010	Ü	ag/L	EPA 8260		09/20		KWM
Chloromethane	0.0010	Ü	∴g/L	EPA 8260		09/20		KWM
2-Chlorotoluene	0.0026	В	mg/L	EPA 8260		09/20		KWM
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/20		KWM
Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/20		KWM
12Dibromo3Chloropropane	0.0010	U	mg/L	EPA 8260		09/20		KWM
1,2-Dibromoethane	**		mg/L	EPA 8260			,	******
Dibromomethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/20		KWM
1,3-Dichlorobenzene	0.0010	Ŭ	mg/L	EPA 8260		09/20		KWM
1,4-Dichlorobenzene	0.0010	Ü	mg/L	EPA 8260		09/20		KWH
Dichlorodifluoromethane	0.0010	Ŭ	mg/L	EPA 8260		09/20		KWM
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/20		KWM
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/20		KWM
cis-1,2-Dichloroethene	0.0010	Ŭ	mg/L	EPA 8260		09/20		KWM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/20		KWM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/20		KWM
1,3-Dichloropropane	0.0010	Ŭ	mg/L	EPA 8260		09/20		KWM
-10 promorobrobatie	0.0010	Ü	mg/L	EPA 8260		09/20		KWH



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemiab Ref.# :93.4692-4 Client Sample ID :LAY-AOC4-2SW05

ES33 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343

Matrix	:WATER SSQ7							AX: (907) 561	
2,2-Dichloropro	nnane	0.0010	,,	~					
1,1-Dichloropro	phane	0.0010	Ü	mg/L		8260		09/20	KW
Ethylbenzene	pene	0.0010	Ü	mg/L		8260		09/20	KWI
Hexachlorobuta	diene	0.0010	Ü	mg/L		8260	09/20	09/20	KW
Isopropylbenzer	110110	0.0010		mg/L		8260			
p-Isopropyltoli	iene		IJ	mg/L		8260		09/20	KWI
Methylene Chlor	ride	0.0010	Ü	mg/L		8260		09/20	KWI
Napthalene	. Iue	0.0010	U	mg/L		8260	09/20	09/20	KWI
n-Propylbenzene				mg/L		8260			
Styrene	3	0.0010	Ü	mg/L		8260		09/20	KWE:
1112-Tetrachlor	costhana	0.0010	Ü	mg/L		8260		09/20	KWM
1122-Tetrachlor	oethane	0.0010	IJ	mg/L		8260	09/20	09/20	KWE
Tetrachloroethe	.oethane	0.0010	U	mg/L		8260	09/20	09/20	K wr
Toluene	ne	0.0010	U	mg/L		8260	09/20	09/20	KWM
1,2,3-Trichloro		0.0010	U	mg/L	EPA	8260	09/20	09/20	KWM
1,2,5-iffchlore	benzene	**		mg/L		8260			
1,2,4-Trichlord	benzene	**		mg/L		8260			
1,1,1-Trichloro	etnane	0.0010	U	mg/L	EPA	8260	09/20	09/20	KWM
1,1,2-Trichlord Trichloroethene	etnane	0.0010	U	mg/L	EPA	8260		09/20	KWM
Trichlorofluoro		0.0010	U	mg/L	EPA	8260		09/20	KWM
1,2,3-Trichloro	methane	0.0010	U	mg/L		8260	09/20	09/20	KWM
1,2,4-Trimethyl	propane	0.0010	Ü	mg/L		8260	09/20	09/20	KWM
1,3,5-Trimethyl	benzene	0.0010	Ü	mg/L		8260	09/20	09/20	UZIM
Vinyl Chloride	Denzene	0.0010	U	mg/L		8260	09/20		
p+m-Xylene		0.0010	U	mg/L		8260	09/20		Kuff
o-Xylene		0.0010	U	mg/L		8260	09/20		KWM
		0.0010	U	mg/L	EPA	8260	09/20	09/20	KWM

See Special Instructions Above

** See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit. D = Secondary dilution.

UA = Unavailable NA = Not Analyzed

LT = Less Than

GT = Greater Than



Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.#

:93.4692-5

Client Sample ID :LAY-A0C4-2SW06 Matrix :WATER

Client Name Ordered By Project Name

:ICF KAISER ENGINEERING :SHERI K ACE

Project#

:DEW LINE RI/FS :41096-412-01

PWSID

:UA

REPORT of ANALYSIS

5633 B STREET ANCHORAGE, AK 99513 TEL: (907) 562-2343 FAX: (907) 561-5301

WORK Order :70792

Report Completed :10/01/93

Collected Received

:09/07/93 @ 17:30 hrs :09/09/93 @ 12:00

Technical Director: STEPHEN, C. EDE Released By :

mertes Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA. EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL. **THESE COMPOUNDS WERE NOT CALIBRATED FOR AT THE TIME. SAMPLE HAD TO BE RUN FOR 8260 SO HOLDING TIMES WOULD NOT BE EXCEEDED. B = THIS FLAG IS USED WHEN THE ANALYTE IS FOUND IN THE ASSOCIATED BLANK AS WELL AS IN THE SAMPLE.

Parameter	Results	Onaj OC	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Hydrocarbons VPH	0.020	: U		TDN 5030 (00154				
Hydrocarbons EPH	0.26	U	mg/L mg/L	EPA 5030/8015M 3510/3550/8100M			09/13	WLS
11-1-4-12			g/ L	2010/01000		09/13	09/15	JBH
Volatile Organics				EPA 8260				
Benzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	17111
Bromobenzene	0.0010	U	mg/L	EPA 8260			09/20	KWM
Bromochloromethane	0.0010	U	mg/L	EPA 8260			09/20	KWM KWM
Bromodichloromethane .	0.0010	U	mg/L	EPA 8260			09/20	KWM
Bromoform	0.0010	U	mg/L	EPA 8260			09/20	
Bromomethane	0.0010	U	mg/L	EPA 8260			09/20	KWM KWM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260			09/20	KWM
sec-Butylbenzene	0.0010	U	mg/L	EPA 8260			09/20	KWM
tert-Butylbenzne	0.0010	Ü	mg/L	EPA 8260			09/20	KWM
Carbon Tetrachloride	0.0010	Ŭ	mg/L	EPA 8260		09/20		KWM
Chloropenzene	0.0010	Ü	mg/L	EPA 8260			09/20	KWM
Chloroethane	0.0010	U	mg/L	EPA 8260		09/20		KWM
Chloroform	0.0010	Ŭ	mg/L	EPA 8260		09/20		KWM
Chloromethane	0.0036	В	mg/L	EPA 8260		09/20		KWH
2-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/20		KWM
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/20		KWM
Dibromochloromethane	0.0010	Ŭ	mg/L	EPA 8260		09/20		KWM
12Dibromo3Chloropropane	**		mg/L	EPA 8260		0 37 20	0 3/ 20	UMIJ
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dibromomethane	0.0010	Ū	mg/L	EPA 8260		09/20		KWM
1,2-Dichloropenzene	0.0010	U	mg/L	EPA 8260		09/20		KWM
1,3-Dichlorobenzene	0.0010	IJ	mg/L	EPA 8260		09/20		KWM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/20		KWM
Dichlorodifluoromethane 1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/20		KWM
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/20		KWM
1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/20		KWM
cis-1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/20		KWM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/20		KWM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/20		KWM
-1- premorobrobale	0.0010	Ü	mg/L	EPA 8260		09/20	09/20	KWM



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemiab Ref.# :93.4692-5 Client Sample ID :LAY-A0C4-2SW06

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343

Matrix :WATER 589	57			TEL: (907) 562-234 FAX: (907) 561-330	
1,3-Dichloropropane 2,2-Dichloropropane 1,1-Dichloropropene Ethylbenzene Hexachlorobutadiene Isopropylbenzene p-Isopropyltoluene Methylene Chloride Napthalene n-Propylbenzene Styrene 1112-Tetrachloroethane 1122-Tetrachloroethane Tetrachloroethene Toluene	0.0010 E 0.0	J mg/L mg/L mg/L mg/L J mg/L J mg/L J mg/L J mg/L J mg/L J mg/L J mg/L J mg/L	EPA 8260 EPA 8260 EPA 8260 EPA 8260 EPA 8260 EPA 8260 EPA 8260 EPA 8260 EPA 8260 EPA 8260 EPA 8260 EPA 8260 EPA 8260 EPA 8260 EPA 8260 EPA 8260 EPA 8260	09/20 09/20 F 09/20 09/20 F 09/20 09/20 F 09/20 09/20 F 09/20 09/20 F 09/20 09/20 F 09/20 09/20 F 09/20 09/20 F 09/20 09/20 F 09/20 09/20 F 09/20 09/20 F 09/20 09/20 F 09/20 09/20 F 09/20 09/20 F 09/20 09/20 F	CWH CWH CWH CWH CWH CWH CWH CWH CWH CWH
Tetrachloroethene Toluene 1,2,3-Trichlorobenzene 1,2,4-Trichloroethane 1,1,2-Trichloroethane Trichloroethene Trichlorofluoromethane 1,2,3-Trichloropropane 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene Vinyl Chloride p+m-Xylene 0-Xylene	0.0010 U 0.0010 U ** 0.0010 U 0.0010 U 0.0010 U 0.0010 U	J mg/L mg/L mg/L mg/L mg/L J mg/L J mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	EPA 8260	09/20 09/20 K 09/20 09/20 K 09/20 09/20 K 09/20 09/20 K 09/20 09/20 K 09/20 09/20 K 09/20 09/20 K 09/20 09/20 K 09/20 09/20 K 09/20 09/20 K 09/20 09/20 K 09/20 09/20 K 09/20 09/20 K 09/20 09/20 K 09/20 09/20 K 09/20 09/20 K	

See Special Instructions Above

** See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed

LT = Less Than GT = Greater Than



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ICF ID	55\$7 LAY- <u>4064</u> -SD01	SSØ7- LAY- A064- SD02	SS⊗7 LAY- AOC4 SD03	,
F&BI Number	628	630	632	U
Sample Type	soil	soil	soil	
Date Received	8/25/93	8/25/93	8/25/93	
% Dry Weight	53	76	62	
Sequence Date	#5-08/25/93	#5-08/25/93	#5-08/25/93	
Leaded Gas	.00		•	
JP-4	<60	< 60	< 60	
Lube Oil	<120	<120	<120	
Diesel	<i>≤</i> 60<90	<60	£60 < 80	
Spike Level			•	
Unknown Semi-volatile				
Pentacosane	106	118	110	
Sequence Date				
PCB 1221				
PCB 1232				
PCB 1016				
PCB 1242				
PCB 1248				
PCB 1254				
PCB 1260				
Spike Level				
Dibutyl Chlorendate				
Sequence Date				
alpha-BHC				
beta-BHC				
gamma-BHC				
delta-BHC				
Heptachlor				
Aldrin				
Heptachlor Epoxide				
Endosulfan I				
DDE				
Dieldrin				
Endrin Endosulfan II				
DDD				
Endrin Aldehyde				
DDT				
Endosulfan Sulfate				
Endrin Ketone				
Methoxy Chlor				
Chlordane				
Dibutyl Chlorendate				
Spike Level				
Vol Sequence	#1&2-08/25/93	#1&2-08/25/93	#1&2-08/25/93	
CCI4				
TCA				
Benzene	< 0.04	< 0.03	< 0.03	
TCE				
Toluene	< 0.04	< 0.03	< 0.03	
PCE				
Ethylbenzene	< 0.04	< 0.03	< 0.03	
Xylenes	< 0.08	< 0.06	< 0.06	-
Gasoline	<4 J	<4 J	<3 五	
Spike level				~ -
BFB	89	94	94	KJB
				6-14-95 6-14-95
				/ /

6.995

	5507	5507	SS\$7	a de c
ICF ID	LAY- AOC4 -SD04	LAY-A OC4 -SW01 558	LAY- AOC4- SW01 582	844.45
F&BI Number	634 soil	water	water	6.11
Sample Type Date Received	8/25/93	8/25/93	8/25/93	
	73	0/25/35	0/23/30	
% Dry Weight	#5-08/25/93	#5-08/27/93		
Sequence Date Leaded Gas	#5-06/25/35	#5-06/27/35		
	<60	<1000		
JP-4	<120	< 2000		
Lube Oil	< 60	<1000		
Diesel	< 60	< 1000		
Spike Level				
Unknown Semi-volatile	110	151		
Pentacosane	110	#5-08/27/93		
Sequence Date		#5-06/27/ 3 5 <2		
PCB 1221		<2		
PCB 1232				
PCB 1016		<2		
PCB 1242		<2		
PCB 1248		<2		
PCB 1254		<2		
PCB 1260		<2		
Spike Level				
Dibutyl Chlorendate		150		
Sequence Date				
alpha-BHC				
beta-BHC				
gamma-BHC				
delta-BHC				
Heptachlor				
Aldrin				
Heptachlor Epoxide				
Endosulfan I				
DDE				
Dieldrin				
Endrin				
Endosulfan II				
DDD				
Endrin Aldehyde				
DDT				
Endosulfan Sulfate				
Endrin Ketone				
Methoxy Chlor				
Chlordane				
Dibutyl Chlorendate				
Spike Level				
Vol Sequence	#1&2-08/25/93		#3&4-08/25/93	
CCI4			<1	
TCA			<1	
Benzene	0.07 ブ	•	<1	
TCE			4	
Toluene	0.04		<1	
PCE .			2	-
Ethylbenzene	0.2		5 T	
Xylenes	0.4 ブ		5123	
Gasoline	3 2		≤ 50 < 100 J	RIA
Spike level				RTB 6-14-95
BFB	94		97	6-14-43

	ICF ID	<i>5</i> 5 <i>6</i> 7 LAY- AOC4 -SW02	SS ♥ 7 LAY- AOC4 -SW02	ይ ያኞች LAY- AOC4 -SW03	
			586	588	
	F&BI Number	584			
	Sample Type	water	water	water	
	Date Received	8/25/93	8/25/93	8/25/93	
	% Dry Weight			"F 66 (67 (66	
	Sequence Date	#5-08/27/93		#5-08/27/93	
	Leaded Gas				
	JP-4	<1000		<1000	
	Lube Oil	< 2000		< 2000	
	Diesel	<1000		<1000	
	Spike Level				
	Unknown Semi-volatile				
	Pentacosane	116		96	
	Sequence Date				
	PCB 1221				
	PCB 1232				
	PCB 1016				
	PCB 1242				
	PCB 1248				
	PCB 1254				
	PCB 1254 PCB 1260				
	Spike Level				
	Dibutyl Chlorendate				
	Sequence Date				
	alpha-BHC				
	beta-BHC				
	gamma-BHC				
	delta-BHC				
	Heptachlor				
	Aldrin				
	Heptachlor Epoxide	•			
	Endosulfan I				
	DDE				
	Dieldrin				
	Endrin				
	Endosulfan II				
	DDD				
	Endrin Aldehyde				
	DDT				
	Endosulfan Sulfate				
	Endrin Ketone				
	Methoxy Chlor				
	Chlordane				
	Dibutyl Chlorendate				
	Spike Level				
	Vol Sequence		#3&4-08/25/93		
	CCI4		<1		
	TCA		<1		
	Benzene		<1		
	TCE		<1		
	Toluene		<1		
			<1		
	PCE Ethylhoppopo		<1		
ł	Ethylbenzene				
ı	Xylenes		<2	^ T	
	Gasoline		≤50 <10	0 1	
	Spike level				
	BFB	•	112		R
					,

-14-0c

LAY-AOC4-SW03 ICF ID 589 F&BI Number Sample Type water 8/25/93 **Date Received** % Dry Weight Sequence Date Leaded Gas JP-4 Lube Oil Diesel Spike Level Unknown Semi-volatile Pentacosane Sequence Date PCB 1221 PCB 1232 **PCB** 1016 PCB 1242 PCB 1248 PCB 1254 PCB 1260 Spike Level Dibutyl Chlorendate Sequence Date alpha-BHC beta-BHC gamma-BHC delta-BHC Heptachlor Aldrin Heptachlor Epoxide Endosulfan I DDE Dieldrin

Endrin

Endosulfan II

DDD

Endrin Aldehyde

DDT

Endosulfan Sulfate

Endrin Ketone

Methoxy Chlor

Chlordane

Dibutyl Chlorendate

Spike Level

Vol Sequence <1 CCI4 <1 **TCA** <1 Benzene 133 4 TCE <1 Toluene <1 PCE <1 Ethylbenzene <2 **Xylenes** 4 100 J ≤50 Gasoline

#3&4-08/25/93

Spike level

100 **BFB**

ANALYTICAL DATA SHEETS FOR CRUSHED DRUM AREA (SS08)



COMMERCIAL TESTING & ENGINEERING CO. ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4327-2

Client Sample ID :LAY A0C5-S06 POINT LAY SOIL SOIL

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

Client Name Ordered By

:ICF KAISER ENGINEERING

Project Name Project#

:RAY MORRIS :DEW LINE RI/FS :41096-412-01

PWSID

:UA

WORK Order

:70058 Report Completed ::0/08/93

Collected

:08/23/93

Received

@ 13:15 hrs :08/25/93 @ 12:00 hrs

Technical Director:STEPHEN C. EDE Released By : Little 6- Edle

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN.

Parameter	QC Results Qual Units	Method	Allowable		
Volatile Organics				Date Date	Init
Benzene Bromobenzene Bromochloromethane Bromodichloromethane Bromoform Bromomethane n-Butylbenzene sec-Butylbenzene tert-Butylbenzene carbon Tetrachloride Chlorobenzene Chlorotehane Chlorotoluene 2-Chlorotoluene d-Chlorotoluene 1/2Dibromo3Chloropropane 1/2-Dibromoethane Dibromomethane 1/2-Dichlorobenzene 1/3-Dichlorobenzene 1/4-Dichlorobenzene 1/1-Dichloroethane 1/2-Dichloroethane 1/2-Dichloroethene 1/2-Dichloroethene 1/2-Dichloropropane 1/3-Dichloropropane 1/3-Dichloropropane 1/3-Dichloropropane 1/3-Dichloropropane 1/3-Dichloropropane 1/1-Dichloropropane 1/1-Dichloropropane 1/1-Dichloropropane 1/1-Dichloropropane 1/1-Dichloropropane 1/1-Dichloropropane 1/1-Dichloropropane	0.250 U mg/Kg 0.250 U mg/Kg	EPA 8260 EPA 8260		Date Date 08/26 09/05	Init HOM HOM HOM HOM HOM HOM HOM HOM HOM HO
Isopropylbenzene p-Isopropyltoluene	1.18 D mg/Kg 1.94 D mg/Kg	EPA 8260 EPA 8260 EPA 8260	0	8/26 09/05 8/26 09/05 8/26 09/05	MC M MC M MC M



ENVIRONMENTAL LABORATORY SERVICES

REPORT OF ANALYSIS 5633 B Chemlab Ref.# :93.4327-2 ANCHORAGE, A Client Sample ID :LAY-A0C5-S06 POINT LAY TEL: (907) 562-2343 Matrix FAX: (907) 561-5301 :SOIL 5508 2-Nitroaniline 0.230 U mg/Kg EPA 8270 09/06 09/29 MTT Dimethylphthalate 0.230 Ü mg/Kg EPA 8270 09/06 09/29 MTT Acenaphthylene 0.230 U mg/Kg EPA 8270 09/06 09/29 MTT 2,6-Dinitrotoluene 0.230 U mg/Kg EPA 8270 09/06 09/29 MTT 3-Nitroaniline 0.230 mg/Kg U EPA 8270 09/06 09/29 MTT Acenaphthene 0.230 U mg/Kg EPA 8270 09/06 09/29 MTT 2,4-Dinitrophenol 0.230 U mg/Kg EPA 8270 09/06 09/29 MTT 4-Nitrophenol 0.230 U mg/Kg EPA 8270 09/06 09/29 MTT Dibenzofuran 0.230 U mg/Kg EPA 8270 09/06 09/29 MTT 2,4-Dinitrotoluene 0.230 U mg/Kg EPA 8270 09/06 09/29 MTT Diethylphthalate 0.230 U mg/Kg EPA 8270 09/06 09/29 MTT 4-Chlorophenyl-Phenylet 0.230 U mg/Kg EPA 8270 09/06 09/29 MTT Fluorene 0.230 U mq/Kq EPA 8270 09/06 09/29 MTT 4-Nitroaniline 0.230 U mg/Kg EPA 8270 09/06 09/29 MTT 4,6-Dinitro-2-Methylphe 0.230 U mg/Kg EPA 8270 09/06 09/29 MTT n-Nitrosodiphenylamine 0.230 U mg/Kg EPA 8270 09/06 09/29 MTT 4-Bromophenyl-Phenyleth 0.230 mg/Kg EPA 8270 09/06 09/29 MTT Hexachlorobenzene 0.230 U mg/Kg EPA 8270 09/06 09/29 MTT Pentachlorophenol 0.230 H mg/Kg **EPA** 8270 09/06 09/29 MTT Phenanthrene 0.230 U mg/Kg **EPA** 8270 09/06 09/29 MTT Anthracene 0.230 mg/Kg U EPA 8270 09/06 09/29 MTT di-n-Butylphthalate 0.230 U mg/Kg EPA 8270 09/06 09/29 MTT Fluoranthene 0.230 U mg/Kg EPA 8270 09/06 09/29 MTT Pyrene 0.230 U mg/Kg EPA 8270 09/06 09/29 TT Butylbenzylphthalate 0.230 U mg/Kg EPA 8270 09/06 09/29 ÌΤ 3,3-Dichlorobenzidine 0.230 U mg/Kg EPA 8270 09/06 09/29 MTT Benzo(a)Anthracene 0.230 U mg/Kg EPA 8270 09/06 09/29 MTT Chrysene 0.230 U mg/Kg EPA 8270 09/06 09/29 MTT bis(2-Ethylhexyl)Phthal 0.230 U mg/Kg EPA 8270 09/06 09/29 MTT di-n-Octylphthalate 0.230 mg/Kg EPA 8270 09/06 09/29 MTT Benzo(b)Fluoranthene 0.230 U mg/Kg EPA 8270 09/06 09/29 MTT Benzo(k)Fluoranthene 0.230 U mg/Kg EPA 8270 09/06 09/29 MTT 0.230 Benzo(a)Pyrene U mg/Kg EPA 8270 09/06 09/29 MTT Indeno(1,2,3-cd)Pyrene 0.230 11 mg/Kg 09/06 09/29 EPA 8270 MTT Dibenz(a,h)Anthracene 0.230 U 09/06 09/29 mg/Kg EPA 8270 MTT Benzo(g,h,i)Perylene 0.230 U mg/Kg EPA 8270 09/06 09/29 MTT Sample Preparation EPA 3050 Digest Total Metals Analysis ICP Screen, ICF EPA n/a Aluminum 3400 D mg/Kg EPA 6010 08/31 09/02 DLG n 2 ma/Ka 7'5 Antimony 56 EPA 6010 08/31 09/02 DLG Arsenic 56 U mg/Kg EPA 6010 08/31 09/02 DLG Earium 360 mg/Kg EPA 6010 08/31 09/02 DLG Beryllium 2.8 U mg/Kg EPA 6010 08/31 09/02 DLG Cadmium 2.8 U mg/Kg EPA 6010 08/31 09/02 DLG Calcium 1200 mg/Kg EPA 6010 08/31 09/02 DLG Chromium 6.7 08/31 09/02 mg/Kg EPA 6010 DLG Cobalt 5.6 mg/Kg EPA 6010 08/31 09/02 DLG Copper 8.6 EPA 6010 mg/Kg 08/31 09/02 DLG Iron 23000 mg/Kg EPA 6010 08/31 09/02 DLG

All charges 2. 12/94



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ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908	REPORT of ANALYSIS SCE	
Chemlab Ref.# :93.4327-2 Client Sample ID :LAY-A0C5-SC Matrix :SOIL SSP8	1 31	5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301
Lead Magnesium Manganese Molybdenum Nickel Potassium Selenium Silver Sodium Thallium Vanadium Zinc	5.6 U mg/Kg EPA 6010 1600 J mg/Kg EPA 6010 220 J mg/Kg EPA 6010 2.8 U mg/Kg EPA 6010 15 mg/Kg EPA 6010 590 mg/Kg EPA 6010 17 J mg/Kg EPA 6010 28 U R mg/Kg J EPA 6010 94 mg/Kg I EPA 6010 94 mg/Kg EPA 6010 0.28 U mg/Kg EPA 7841 19 mg/Kg EPA 6010 37 mg/Kg EPA 6010	08/31 09/02 DLG 08/31 09/02 DLG 08/31 09/02 DLG 08/31 09/02 DLG 08/31 09/02 DLG 08/31 09/02 DLG 08/31 09/06 DLG 08/31 09/02 DLG 08/31 09/02 DLG 08/31 09/02 DLG 08/31 09/06 DLG 08/31 09/06 DLG 08/31 09/06 DLG

ph charges s. 2/2/94

See Special Instructions Above See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit. D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed LT = Less Than

GT = Greater Than



SES Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4327-4

Client Sample ID :LAY-AOC5-SO6 POINT LAY DUPLICATE Matrix :SOIL

12.6.95

Client Name :ICF KAISER ENGINEERING Ordered By :RAY MORRIS

Project Name :DEW LINE RI/FS

Project# PWSID

:41096-412-01 :UA

:70058 WORK Order

Report Completed :10/08/93

:08/23/93 Collected @ 13:15 hrs :08/25/93 @ 12:00 Received hrs

ANCHORAGE, AK 99518

TEL: (907) 562-2343

FAX: (907) 561-5301

Technical Director: STEPHEN C. EDE Released By : STEPHEN C.

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN.

Parameter	Results	Oual Oual	Unite	Method	Allowable Limits	Ext. Date	Anal Date	Init
	Veagrea.			116 C11001				
Sample Preparation				EPA 3050 Digest				
Total Metals Analysis				-				
ICP Screen, ICF				EPA	n/a			
Aluminum	3100		mg/K g	EPA 6010			09/02	DLG
Antimony	56	U	mg/Kg	EPA 6010			09/02	DLG
Arsenic	56	U	mg/Kg	EPA 6010			09/02	DLG
Barium	420		mg/Kg	EPA 6010			09/02	DLG
Beryllium	2.8	U	mg/Kg	EPA 6010			09/02	DLG
Cadmium	2.8	U	mg/Kg	EPA 6010			09/02	Pr.G
Calcium	1400		mg/Kg	EPA 6010			09/02	G G
Chromium	9.7		mg/Kg	EPA 6010			09/02	₽₽G
Cobalt	5.6	U	mg/Kg	EPA 6010			09/02	DLG
Copper	9.2		mg/K g	EPA 6010			09/02	DLG
Iron	23000		mg/K g	EPA 6010			09/02	CLG
Lead	16		m g/K g	EPA 6010			09/02	DLG
Magnesium	1300		mg/Kg	EPA 6010			09/02	DLG
Manganese	210		m g/K g	EPA 6010			09/02	DLG
Molybdenum	2.8	U	mg/Kg	EPA 6010	•		09/02	DLG
Nickel	13		mg/Kg	EPA 6010	•		09/02	DLG
Potassium	610		mg/Kg	EPA 6010			09/06	DLG
Selenium	56	U	mg/Kg	EPA 6010			09/02	DLG
Silver	28	U	mg/Kg	EPA 6010			09/02	DLG
Sodium	95		mg/Kg	EPA 6010			09/06	DLG
Thallium	0.28	U	mg/Kg	EPA 7841			09/01	KAF
Vanadium	18		mg/Kg	EPA 6010			09/02	DLG
Zinc	34		mg/Kg	EPA 6010		08/31	09/02	DLG

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed LT = Less Than

GT = Greater Than



See Special Instructions Above

See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.#

:93.4327-3

Client Sample ID :LAY-A0C5-S06 POINT LAY SPIKE Matrix :SOIL \$2605

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343

Client Name Ordered By

:ICF KAISER ENGINEERING :RAY MORRIS

WORK Order

FAX: (907) 561-5301

Report Completed :10/08/93

:70058

Project Name

:DEW LINE RI/FS

Collected

:08/23/93 @ 13:15 hrs

Project#

:41096-412-01

:08/25/93 @ 12:00 hrs

PWSID

:UA

Received

Released By :

Technical Director: STEPHEN C. EDE

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN. FOR QC RESULTS PLEASE SEE QC SUMMARY.

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Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Semivolatile Organics Phenol bis(2-Chloroethyl)ether 2-Chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene Benzyl Alcohol 1,2-Dichlorobenzene 2-Methylphenol bis(2-Chloroisopropyl)e 4-Methylphenol n-Nitroso-di-n-Propylam Hexachloroethane Nitrobenzene Isophorone 2-Nitrophenol 2,4-Dimethylphenol Benzoic Acid bis(2-Chloroethoxy)Meth 2,4-Dichlorophenol 1,2,4-Trichlorobenzene Naphthalene 4-Chloroaniline Hexachlorocyclopentadie 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronaphthalene 2-Nitroaniline Dimethylphthalate Acenaphthylene 2,6-Dinitrotoluene 3-Nitroaniline Acenaphthene 2,4-Dinitrophenol	1.61 0.230 1.52 0.23 0.23 0.23 0.23 0.230	U U U U U U U U	mag/kggag/kkgag/kkggagag/kkggagag/kkggagag/kkggagag/kkggagag/kkggagag/kkggagag/kkggagag/kkggagag/kkggagag/kkggagag/kkggagag/kkggagag/kkggagag/kkggagag/kkggagag/kkggagag/kkggagag/kkggagagag/kkggagagag/kkggagagag/kkggagagag/kkggagagag/kkggagagaga	EPA 8270 EPA 8270		09/06 09/06 09/06 09/06 09/06 09/06 09/06 09/06 09/06 09/06 09/06	09/29 09/29	MITT MITT MITT MITT MITT MITT MITT MITT



Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

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Chemlab Ref.#	:93.4327-3	1	REPO!	RT of ANA	5633 B STREE		
Client Sample ID	:LAY-AOC5-SO6 :SOIL SSOS	FOINT	LAY	SPIKE		ANCHORAGE, AK TEL: (907) 562 FAX: (907) 561	62-2343
4-Nitrophenol Dibenzofuran	Z695	2.15 0.230	U	mg/Kg mg/Kg	EPA 8270 EPA 8270	09/06 09/29 09/06 09/29	MT MT

Matrix	:SOIL SUP						FAX	: (907) 56	1-5301
	12.69								
4-Nitrophenol		2.15		mg/Kg	EPA 8270		09/06 0	19/29	MTI
Dibenzofuran		0.230	Ü	mg/Kg	EPA 6270		09/06 0		MTI
2,4-Dinitroto	luene	2.28		mg/Kg	EPA 8270		09/06 0		ETM
Diethylphthal	.ate	0.230	IJ	mg/Kg	EPA 8270		09/06 0		MTI
4-Chloropheny	'l-Phenvlet	0.230	Ü	mg/Kg	EPA 8270		09/06 0		MTI
Fluorene		0.230	Ü	mg/Kg	EPA 8270				
4-Nitroanilin	ıe.	0.230	Ü				09/06 0		TTM
4,6-Dinitro-2		0.230	Ü	mg/Kg	EPA 8270		09/06 0		MTT
n-Nitrosodiph	envlamine	0.230		mg/Kg	EPA 8270		09/06 0		MTT
4-Bromophenyl	-Phenuleth		U	mg/Kg	EPA 8270		09/06 0		MTT
Hexachloroben	Zeno	0.230	Ü	mg/Kg	EPA 8270		09/06 0	•	MTT
Pentachloroph		0.230	Ü	mg/Kg	EPA 8270		09/06 0		MTI
Phenanthrene	EHOT	3.28		mg/Kg	EPA 8270		09/06 0		MTT
Anthracene		0.230	Ü	mg/Kg	EPA 8270		09/06 0		TTM
	5-1-4	0.230	U	mg/Kg	EPA 8270		09/06 0		MTT
di-n-Butylpht	narate	2.47		mg/Kg	EPA 8270		09/06 0	9/29	MTT
Fluoranthene		0.230	Ü	mg/Kg	EPA 8270		09/06 0	9/29	MTT
Pyrene		2.13		mg/Kg	EPA 8270		09/06 0	9/29	MTT
Butylbenzylph	thalate	0.230	U	mg/Kg	EPA 8270		09/06 0	9/29	MTT
3,3-Dichlorob		0.230	U	mg/Kg	EPA 8270		09/06 0		MTT
Benzo(a)Anthr	acene	0.230	U	mg/Kg	EPA 8270		09/06 0	9/29	MTT
Chrysene	3.5	0.230	U	mg/Kg	EPA 8270		09/06 09	9/29	MTT
bis(2-Ethylhe	xyl)Phthal	0.230	U	mg/Kg	EPA 8270		09/06 09	9/29	MTT
di-n-Octylpht		0.230	U	mg/Kg	EPA 8270		09/06 09		
Benzo(b)Fluor		0.230	Ü	mg/Kg	EPA 8270		09/06 09		T
Benzo(k)Fluor		0.230	Ü	mg/Kg	EPA 8270		09/06 09		MTT
Benzo(a)Pyren		0.230	U	mg/Kg	EPA 8270		09/06 09		
Indeno(1,2,3-	cd)Pyrene	0.230	U	mg/Kg	EPA 8270		09/06 09		
Dibenz(a,h)An		0.230	U	mg/Kg	EPA 8270		09/06 09		4.77
Benzo(g,h,i)P	erylene	0.230	U	mg/Kg	EPA 8270		09/06 09		MTT
Sample Prepara	ation				EPA 3050 Digest				
Total Metals A	Analysis								
ICP Screen, IC	CF				EPA	n/a			
Aluminum		4060		mg/Kg	EPA 6010	, a	08/31 09	1/02	DLG
Antimony		540		mg/Kg	EPA 6010		08/31 09		D L.G
Arsenic		140		mg/Kg	EPA 6010		08/31 09		DLG
Barium		490		mg/Kg	EPA 6010		08/31 09		DLG
Beryllium		45		mg/Kg	EPA 6010		08/31 09		DLG
Cadmium		53		mg/Kg	EPA 6010		08/31 09		DLG
Calcium		2300		mg/Kg	EPA 6010		08/31 09	/02	DLG
Chromium		120		mg/Kg	EPA 6010		08/31 09		DLG
Cobalt		110		mg/Kg	EPA 6010		08/31 09		DLG
Copper		100		mg/Kg	EPA 6010		08/31 09		DLG
Iron		24000		mg/Kg	EPA 6010		08/31 09		DLG
Lead		100		mg/Kg	EPA 6010		08/31 09		DLG
Magnesium		2400		mg/Kg	EPA 6010		08/31 09		DLG
Manganese		830		mg/Kg	EPA 6010		08/31 09		DLG
Molybdenum		100		mg/Kg	EPA 6010		08/31 09		DLG
Nickel		120		mg/Kg	EPA 6010		08/31 09		DLG
Potassium		1700		mg/Kg	EPA 6010		08/31 09		DLG
Selenium		145		mg/Kg	EPA 6010		08/31 09		عادل
		2 10		g/ 1/g	FLY OOTO		00/31 03	/ 02	'ک
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ENVIRONMENTAL LABORATORY SERVICES

3 1425 1929						
Chemlab Ref.# :93		ORT of ANALYSIS	XL	5633 B STREET		
Client Sample ID :LA Matrix :SO	OIL STATE	SPIKE		ANCHORAGE, AK 9951 TEL: (907) 562-234 FAX: (907) 561-530	52-2343	
Silver Sodium Thallium Vanadium Zinc	12.6.95 97 1100 2.3 120 140	mg/Kg EPA mg/Kg EPA mg/Kg EPA	A 6010 A 7841 A 6010	08/31 09/06 D 08/30 09/01 K 08/31 09/02 D	CAF CLC	

See Special Instructions Above

See Sample Remarks Above

= Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed

LT = Less Than

GT = Greater Than



Member of the SGS Group (Société Générale de Surveillance)



REPORT of ANALYSIS

ENVIRONMENTAL LABORATORY SERVICES

:93.4327-10

Chemlab Ref.#

Client Sample ID :LAY AOC5-SO6 POINT LAY SPIKE DUPLICATE Matrix :SOIL SSOE

5633 B STREET ANCHORAGE, AK 99513 TEL: (907) 562-2343 FAX: (907) 551-5301

Client Name Ordered By

:ICF KAISER ENGINEERING :RAY MORRIS

Project Name Project#

PWSID

:DEW LINE RI/FS :41096-412-01

:UA

WORK Order

:70058 Report Completed :10/08/93

Collected Received

:08/23/93 @ 13:15 hr :08/25/93 @ 12:00 hr

Technical Director: STEPHEN C. EDE
Released By : Statute C. Eff

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN. 8270: SAMPLE IS SPIKED WITH 100 PPM SPIKE, INTERNAL STANDARD WAS ADDED TWICE,

SAMPLE CONCENTRATION MUST BE MULTIPLIED BY TWO TO COMPENSATE FOR THIS.

 Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Semivolatile Organics Phenol bis(2-Chloroethyl)ether 2-Chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene Benzyl Alcohol 1,2-Dichlorobenzene 2-Methylphenol bis(2-Chloroisopropyl)e 4-Methylphenol n-Nitroso-di-n-Propylam Hexachloroethane Nitrobenzene Isophorone 2-Nitrophenol 2,4-Dimethylphenol Benzoic Acid bis(2-Chloroethoxy).Meth 2,4-Dichlorophenol 1,2,4-Trichlorobenzene Naphthalene 4-Chloro-3-Methylphenol 2-Methylnaphthalene Hexachlorocyclopentadie 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronaphthalene 2-Nitroaniline Dimethylphthalate Acenaphthylene 2,6-Dinitrotoluene 3-Nitroaniline Acenaphthene	0.628 0.230 0.502 0.230 0.230 0.230 0.230 0.230 0.23 0.23	U U U U U U	mg/Kgg	EPA 8270 EPA 8270		09/06 09/06 09/06 09/06 09/06 09/06 09/06 09/06	09/29 09/29 09/29 09/29 09/29 09/29 09/29 09/29 09/29 09/29 09/29 09/29 09/29 09/29 09/29 09/29	
							1	



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS Chemlab Ref.# :93.4327-10 5633 B STREET ANCHORAGE, AK 99518 Client Sample ID :LAY-AOC5-S06 POINT LAY SPIKE DUPLICATE TEL: (907) 562-2343 :SOIL SECS Matrix FAX: (907) 561-5301 2,4-Dinitrophenol 0.230 09/06 09/29 mg/Kg EPA 8270 TTM 4-Nitrophenol 0.904 **EPA 8270** mg/Kg 09/06 09/29 MTI Dibenzofuran 0.230 U mq/Kq EPA 8270 09/06 09/29 MTT 2,4-Dinitrotoluene 1.28 09/06 09/29 mg/Kg EPA 8270 MTT Diethylphthalate 0.230 U EPA 8270 ma/Ka 09/06 09/29 MTT 4-Chlorophenyl-Phenylet 0.230 U 09/06 09/29 mg/Kg EPA 8270 MTT Fluorene 0.230 U mg/Kg EPA 8270 09/06 09/29 MTT 4-Nitroaniline 0.230 U mg/Kg EPA 8270 09/06 09/29 MTT 4,6-Dinitro-2-Methylphe 0.230 H **EPA** 8270 mg/Kg 09/06 09/29 MTT n-Nitrosodiphenylamine 0.230 [] mg/Kg EPA 8270 09/06 09/29 MTT 4-Bromophenyl-Phenyleth 0.230 U mg/Kg EPA 8270 09/06 09/29 MTT Hexachlorobenzene 0.230 П EPA 8270 mg/Kg 09/06 09/29 MTT Pentachlorophenol 1.82 mq/Kq EPA 8270 09/06 09/29 MTT Phenanthrene 0.230 U mg/Kg EPA 8270 09/06 09/29 MTT Anthracene 0.230 mg/Kg EPA 8270 09/06 09/29 MTT di-n-Butylphthalate 1.76 mg/Kg EPA 8270 09/06 09/29 MTT Fluoranthene 0.230 mg/Kg EPA 8270 09/06 09/29 MTT Pyrene 1.50 mg/Kg EPA 8270 09/06 09/29 MTT Butylbenzylphthalate 0.230 Ħ mg/Kg EPA 8270 09/06 09/29 MTT 3,3-Dichlorobenzidine 0.230 U 09/06 09/29 mg/Kg EPA 8270 MTT Benzo(a)Anthracene 0.230 U mg/Kg **EPA** 8270 09/06 09/29 MTT Chrysene 0.230 U **EPA** 8270 mg/Kg 09/06 09/29 MTT bis(2-Ethylhexyl)Phthal 0.230 U mg/Kg **EPA** 8270 09/06 09/29 MTT di-n-Octylphthalate 0.230 U mg/Kg **EPA** 8270 09/06 09/29 MTT Benzo(b)Fluoranthene 0.230 U EPA 8270 mg/Kg 09/06 09/29 MTT Benzo(k)Fluoranthene 0.230 U EPA 8270 mg/Kg 09/06 09/29 MTT Benzo(a)Pyrene 0.230 U **EPA** 8270 mg/Kg 09/06 09/29 MTT Indeno(1,2,3-cd)Pyrene 0.230 U mg/Kg **EPA** 8270 09/06 09/29 MIT Dibenz(a,h)Anthracene 0.230 U mg/Kg **EPA** 8270 09/06 09/29 MTT

See Special Instructions Above

See Sample Remarks Above

= Undetected, Reported value is the practical quantification limit.

0.230

U

mg/Kg

EPA 8270

D = Secondary dilution.

Benzo(g,h,i)Perylene

UA = Unavailable

NA = Not Analyzed

09/06 09/29

MTT

LT = Less Than

GT = Greater Than





ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4693-1

Client Sample ID :LAY-AOC5-2508 POINT LAY

Matrix

:SOIL STOPS

:ICF KAISER ENGINEERING Client Name

:SHERI K ACE Ordered By Project Name

:DEWLINE RI/FS :41096-412-01

Project# PWSID

:UA

WORK Order

Report Completed :11/09/93

Collected

Received

:09/07/93 @ 14:35 hrs. :09/09/93

@ 12:00 hrs

5633 B ST

FAX: (907) 561-5301

ANCHORAGE, AK 99518 TEL: (907) 562-2343

Technical Director: STEPHEN C. EDE

Released By :

8270: UNABLE TO ANALYZE. Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC.

LOST DURING EXTRACTION PROCESS.

Qualifier/Comments

:70764

	Ext. Date	Anal Date	Init
Percent Solids 93.1 % SM17 2540G		09/10	EAL
/		09/20	JBH
Hydrocarbons VPH 22.6 mg/Kg EPA 5030/8015M 0	09/10	09/18	WLS
Volatile Organics EPA 8260			
		10/01	KWM
		10/01	KWM
		10/01	KWM
		10/01	WWM
310		10/01	M
520		10/01	-KWM
***************************************		10/01	KWM
		10/01	KWM
		10/01	KWM
		10/01	KWM
01.1201.000.1.001.0		10/01	KWM
		10/01	KWM
		10/01	KWM
0.200.000		10/01	KWM
1 0.000		10/01	KWM
		10/01	-KWM
1.4-Dichlorobenzene 0.100 U mg/Kg EPA 8260 0		10/01	KWM
		10/01	KWM
1,1-Dichloroethane 0.100 U mg/kg EPA 8260 0		10/01	KWM
1.2-Dichloroethane 0.100 U mg/Kg EPA 8260 0		10/01	KWM
1,1-Dichloroethene 0.100 U mg/Kg EPA 8260 0		10/01	KWM
cis-1,2-Dichloroethene 0.100 U mg/Kg EPA 8260 0		10/01	KWM
trans1.2-Dichloroethene 0.100 U mg/Kg EPA 8260 0		10/01	KWM
1,2-Dichloropropane 0.100 U mg/Kg EPA 8260 0		10/01	KWM
1.3-Dichloropropane 0.100 U mg/Kg EPA 8260 0		10/01	KWM
2,2-Dichloropropane 0.100 U mg/Kg EPA 8260 0	09/10	10/01	KWM



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ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS Chemlab Ref.# :93.4693-1

Client Sample ID :LAY-A0C5-2S08 POINT LAY Matrix :SOIL 5578

5633 B STREET ANCHORAGE. AK 99518

Chalfier / Commets FAX: (907) 562-23-3
FAX: (907) 561-5301

							V /			
1,1-Dichloropropene		0.100	U	mg/Kg	EPA	8260	T)-A.I	09/10	10/01	KWM
Ethylbenzene		0.100	Ū	mg/Kg	EPA	8260	•	09/10		KWM
Hexachlorobutadiene		0.100	Ū	mg/Kg		8260		09/10	-	KWM
Isopropylbenzene		0.100	Ü	mg/Kg		8260		09/10	•	KWM
p-Isopropyltoluene		0.100	Ū	mg/Kg		8260		09/10		KWM
Methylene Chloride	_	0.100	Ü	mg/Kg		8260		09/10		KWM
Napthalene		0.100	Ü	mg/Kg		8260		09/10		KWM
n-Propylbenzene		0.100	Ü	mg/Kg		8260		09/10		KWM
Styrene		0.100	Ü	mg/Kg		8260		09/10		KWM
1112-Tetrachloroethane		0.100	Ü	mg/Kg		8260		09/10		KWM
1122-Tetrachloroethane		0.100	Ū	mg/Kg		8260		09/10		KWM
Tetrachloroethene		0.100	Ū	mg/Kg		8260			10/01	KWM
Toluene		0.308	ā	mg/Kg		8260		09/10		KWM
1,2,3-Trichlorobenzene		0.100	Ü	mg/Kg		8260		09/10		KWM
1,2,4-Trichlorobenzene		0.100	Ü	mg/Kg		8260	1	09/10	-	KWM
1,1,1-Trichloroethane		0.100	Ü	mg/Kg		8260	1	09/10		KWM
1,1,2-Trichloroethane		0.100	Ü	mg/Kg		8260		09/10		KWM
Trichloroethene		0.100	Ü	mg/Kg		8260		09/10		KWM
Trichlorofluoromethane		0.100	Ü	mg/Kg		8260		09/10		KWM
1,2,3-Trichloropropane		0.100	Ŭ	mg/Kg		8260		09/10		KWM
1,2,4-Trimethylbenzene		0.264	D	mg/Kg		8260		09/10		KWM
1,3,5-Trimethylbenzene		0.153	D	mg/Kg		8260		09/10	10/01	KWM
Vinyl Chloride		0.100	U	mg/Kg		8260		09/10	10/01	KWM
p+m-Xylene		0.348	D	mg/Kg		8260		09/10	10/01	KWM
o-Xylene		0.142	D	mg/Kg	EPA		Þ	09/10	10/01	KWM
-				, -, _						

= Secondary dilution.

UA = Unavailable

NA = Not Analyzed

LT = Less Than

GT = Greater Than



SSS Member of the SGS Group (Société Générale de Surveillance)

See Special Instructions Above

See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.#

:93.4693-2

Client Sample ID :LAY-AOC5-2508 SPIKE

Matrix

Client Name

SOIL STATE OF THE

Ordered By Project Name Project#

:DEWLINE RI/FS

PWSID

:SHERI K ACE

:41096-412-01

:UA

5633 B ST ANCHORAGE, AK 99518 TEL: (907) 562-23-3 FAX: (907) 561-5301

:70764

:11/09/93

:09/07/93 @ 14:35 hrs :09/09/93 @ 12:00 hrs

Received Technical Director: STEPHEN C. EDE

Released By :

WORK Order

Collected

Report Completed

Sample Remarks: SAMPLE COLL. BY: SMF AND RCC. FOR SPIKING CONC. AND % RECOVERIES, SEE QA/QC PACKAGE. FOR 8260 SPIKE & SPIKE DUP., SEE WO# 93.4727-12,13. B= THIS FLAG IS USED WHEN THE ANALYTE IS FOUND IN THE ASSOCIATED BLANK AS WELL AS IN THE SAMPLE. J= INDICATES AN ANALYTE WHOSE CONC. IS EST. BECAUSE THE ANALYTE'S CONC. IS DETECTED BELOW THE CALIBRATION RANGE.

Parameter Results Qual Units Method Limits Date	Date	Init
	09/10	EAL
Hydrocarbons EPH 3470 D mg/Kg 3510/3550/8100M 09/14 Hydrocarbons VPH 1230 D mg/Kg EPA 5030/8015M 09/10		JBH WLS
Semivolatile Organics EPA 8270		
Phenol 1.82 J mg/Kg EPA 8270 09/17	10/25	GV
bis(2-Chloroethyl)ether 2.14 U mg/kg EPA 8270 09/17	10/25	V
2-Chlorophenol 1.67 J mg/Kg EPA 8270 09/17		GV
1.3-Dichlorobenzene 2.14 U mg/Kg EPA 8270 09/17	10/25	GV
1,4-Dichlorobenzene 1.66 J mg/Kg EPA 8270 09/17	10/25	G V
Benzyl Alcohol 2.14 U mg/Kg FPA 8270 09/17	10/25	GV
1,2-Dichlorobenzene 2.14 U mg/Kg EPA 8270 09/17	10/25	GΫ
2-Methylphenol 2.14 U mg/Kg EPA 8270 09/17	10/25	GV
bis(2-Chloroisopropyl)e 2.14 U mg/Kg EPA 8270 $09/17$	10/25	GV
4-Methylphenol 2.14 U mg/Kg EPA 8270 09/17	10/25	GV
n-Nitroso-di-n-Propylam 1.93 J mg/kg EPA 8270 09/17	10/25	GV
Hexachloroethane 2.14 U mg/Kg EPA 8270 09/17	10/25	GΫ
Nitrobenzene 2.14 U mg/Kg EPA 8270 09/17	10/25	GΫ
Isophorone 2.14 U ma/Ka EPA 8270 09/17	10/25	G V
2-Nitrophenol 2.14 U mg/Kg EPA 8270 09/17	10/25	G V
2,4-Dimethylphenol 2.14 U mg/Kg EPA 8270 09/17	10/25	GV
Benzoic Acid 2.14 U mg/Kg EPA 8270 09/17	10/25	GV
bis(2-Chloroethoxy)Meth 2.14 U mg/Kg EPA 8270 09/17	10/25	GV
2,4-Dichlorophenol 2.14 U mg/Kg EPA 8270 09/17	10/25	- G V
1,2,4-Trichlorobenzene 1.98 J mg/Kg EPA 8270 09/17	10/25	GV
Naphthalene 2.14 U mg/Kg EPA 8270 09/17	10/25	GV
4-Chloroaniline 2.14 U mg/Kg EPA 8270 09/17	10/25	G V
Hexachlorobutadiene 2.14 U mg/Kg EPA 8270 09/17	10/25	G V
4-Chloro-3-Methylphenol 2.14 U mg/Kg EPA 8270 09/17	10/25	GV
2-Methylnaphthalene 2.14 U mg/Kg EPA 8270 09/17	10/25	GΫ
Hexachlorocyclopentadie 2.14 U mg/Kg EPA 8270 09/17	10/25	G V
2,4,6-Trichlorophenol 2.14 U mg/Kg EPA 8270 09/17	10/25	GV
2,4,5-Trichlorophenol 2.14 U mg/Kg EPA 8270 09/17	10/25	G V
2-Chloronaphthalene 2.14 U mg/Kg EPA 8270 09/17	10/25	GV



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS Chemlab Ref.# :93.4693-2 5633 B STREET Client Sample ID :LAY-AOC5-2508 SPIKE Matrix :SOIL SCOR ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301 2-Nitroaniline 2.14 mg/Kg EPA 8270 09/17 10/25 GV Dimethylphthalate 2.14 Ü EPA 8270 mg/Kg 09/17 10/25 GV Acenaphthylene 2.14 ij mg/Kg EPA 8270 09/17 10/25 GV 2,6-Dinitrotoluene 2.14 IJ mg/Kg EPA 8270 09/17 10/25 GV 3-Nitroaniline 2.14 IJ mq/Kq EPA 8270 09/17 10/25 GV Acenaphthene 4.64 ma/Ka EPA 8270 09/17 10/25 GV 2.4-Dinitrophenol 2.14 mg/Kg EPA 8270 09/17 10/25 GV 4-Nitrophenol 4.66 mg/Kg EPA 8270 09/17 10/25 GV Dibenzofuran 2.14 U EPA 8270 mg/Kg 09/17 10/25 GV 2,4-Dinitrotoluene 2.75 mg/Kg EPA 8270 GV 09/17 10/25 Diethylphthalate 2.14 IJ mq/Kq EPA 8270 09/17 10/25 GV 4-Chlorophenyl-Phenylet 2.14 09/17 10/25 mg/Kg EPA 8270 ${\sf GV}$ Fluorene 2.99 mg/Kg EPA 8270 09/17 10/25 GV 4-Nitroaniline 2.14 U mg/Kg EPA 8270 09/17 10/25 GV 4,6-Dinitro-2-Methylphe 2.14 U mg/Kg EPA 8270 09/17 10/25 GV n-Nitrosodiphenylamine 2.14 U mg/Kg EPA 8270 09/17 10/25 GV 4-Bromophenyl-Phenyleth 2.14 U mg/Kg EPA 8270 09/17 10/25 GV Hexachlorobenzene mg/Kg 2.14 U EPA 8270 09/17 10/25 GV Pentachlorophenol 0.207 mg/Kg **EPA** 8270 09/17 10/25 GV Phenanthrene 2.14 U EPA 8270 mg/Kg 09/17 10/25 GV Anthracene 2.14 U mg/Kg EPA 8270 09/17 10/25 GV di-n-Butylphthalate 7.79 В mg/Kg EPA 8270 09/17 10/25 GV Fluoranthene 2.14 U mg/Kg **EPA** 8270 09/17 10/25 GV Pyrene 6.52 mg/Kg EPA 8270 09/17 10/25 GV Butylbenzylphthalate 2.14 Ü mg/Kg EPA 8270 09/17 10/25 GV 3,3-Dichlorobenzidine 2.14 U **EPA** 8270 mg/Kg 09/17 10/25 **GV** Benzo(a)Anthracene 2.14 U mq/Ka **EPA** 8270 09/17 10/25 GV Chrysene 2.14 U mg/Kg **EPA** 8270 09/17 10/25 GV bis(2-Ethylhexyl)Phthal 4.24 mg/Kg **EPA** 8270 09/17 10/25 GV di-n-Octylphthalate 2.14 U EPA 8270 mg/Kg 09/17 10/25 GV Benzo(b)Fluoranthene 2.14 U mg/Kg EPA 8270 09/17 10/25 GV Benzo(k)Fluoranthene 2.14 U mg/Kg EPA 8270 09/17 10/25 GV Benzo(a)Pyrene

See Special Instructions Above See Sample Remarks Above

Indeno(1,2,3-cd)Pyrene

Dibenz(a,h)Anthracene

Benzo(g,h,i)Perylene

= Undetected, Reported value is the practical quantification limit. D = Secondary dilution.

2.14

2.14

2.14

2.14

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U

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mg/Kg

mg/Kg

mq/Kq

mg/Ka

EPA 8270

EPA 8270

EPA 8270

EPA 8270

UA = Unavailable

09/17 10/25

09/17 10/25

09/17 10/25

09/17 10/25

GV

GV

GV

GV

NA = Not Analyzed LT = Less Than

GT = Greater Than



SSS Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.#

:93.4693-3

Client Sample ID :LAY-A0C5-2508 SPIKE DUFLICATE Matrix :SOIL SOP

12693

:ICF KAISER ENGINEERING :SHERI K ACE

Ordered By Project Mame Project#

Client Name

:DEWLINE RI/FS :41096-412-01

PWSID

:UA

WORK Order Report Completed

Collected

:70764

:11/09/93

:09/07/93 @ 14:35 hrs :09/09/93 @ 12:00 hrs

5533 B ST

EL: (907) 562-2343 FAX: (907) 561-5301

ANCHORAGE, AK 99518

Received Technical Director: STEPHEN C. EDE

Released By :

Mu.

Sample Remarks: SAMPLE COLL. BY: SMF AND RCC. FOR 8260 SPIKE AND SPIKE DUP: SEE WO# 93.4727-12,13. FOR SPIKING CONC. AND % RECOVERIES, SEE QA/QC PACKAGE. B= THIS FLAG IS USED WHEN THE ANALYTE IS FOUND IN THE ASSIATED BLANK AS WELL AS IN THE SAMPLE. J= INDICATES AN ANALYTE WHOSE CONC. IS EST. BECAUSE THE ANALYTE'S CONC. IS DETECTED BELOW THE CALIBRATION RANGE.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	93.1		~ <u>~-</u>	SM17 2540G			09/10	EAL
Hydrocarbons EPH	4040	D	mg/Kg	3510/3550/8100M		09/14	09/21	JBH
Hydrocarbons VPH	1120	D	mg/Kg	EPA 5030/8015M			09/18	WLS
Semivolatile Organics				EPA 8270				
Phenol	1.73	J	mg/Kg	EPA 8270		09/17	10/25	V-CV
bis(2-Chloroethyl)ether	2.13	U	mg/Kg	EPA 8270			10/25	ΣV
2-Chlorophenol	1.59	J	mg/Kg	EPA 8270			10/25	GV
1,3-Dichlorobenzene	2.13	Ü	mg/Kg	EPA 8270			10/25	G V
1,4-Dichlorobenzene	1.60	J	mg/Kg	EPA 8270			10/25	G V
Benzyl Alcohol	2.13	Ü	mg/Kg	EPA 8270			10/25	G V
1,2-Dichlorobenzene	2.13	U	mg/Kg	EPA 8270		09/17		G V
2-Methylphenol	2.13	Ū	mg/Kg	EPA 8270			10/25	G V
bis(2-Chloroisopropyl)e	2.13	U	mg/Kg	EPA 8270			10/25	GV
4-Methylphenol	2.13	U	mg/Kg	EPA 8270			10/25	GV
n-Nitroso-di-n-Propylam	1.90	J	mg/Kg	EPA 8270		09/17		GV
Hexachloroethane	2.13	U	mg/Kg	EPA 8270		09/17		GΫ
Nitrobenzene	2.13	U	mg/Kg	EPA 8270		09/17		G V
Isophorone	2.13	Ü	mg/Kg	EPA 8270		09/17		GΫ
2-Nitrophenol	2.13	U	mg/Kg	EPA 8270		09/17		GV
2,4-Dimethylphenol	2.13	U	mg/Kg	EPA 8270		09/17		G V
Benzoic Acid	2.13	U	mg/Kg	EPA 8270		09/17		GV
bis(2-Chloroethoxy)Meth	2.13	U	mg/Kg	EPA 8270		09/17		GV
2,4-Dichlorophenol	2.13	Ü	mg/Kg	EPA 8270		09/17		- G V
1,2,4-Trichlorobenzene	1.81	J	mg/Kg	EPA 8270		09/17		GΨ
Naphthalene	2.13	U	mg/Kg	EPA 8270		09/17		GV
4-Chloroaniline	2.13	U	mg/Kg	EPA 8270		09/17		GV
Hexachlorobutadiene	2.13	Ŭ	mg/Kg	EPA 8270		09/17	10/25	GV
4-Chloro-3-Methylphenol	2.13	ប	mg/Kg	EPA 8270		09/17		GV
2-Methylnaphthalene	2.13	U	mg/Kg	EPA 8270		09/17		GV
Hexachlorocyclopentadie	2.13	U	mg/Kg	EPA 8270		09/17		GV
2,4,6-Trichlorophenol	2.13	Ū	mg/Kg	EPA 8270		09/17		GΫ
2,4,5-Trichlorophenol	2.13	Ū	mg/Kg	EPA 8270		09/17		G V
2-Chloronaphthalene	2.13	Ū	mg/Kg	EPA 8270		09/17		V
			پ ، ب	<u> </u>			. – -	



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS Chemlab Ref.# :93.4693-3 5633 B STREET Client Sample ID :LAY A0C5=2S08 SPIKE DUPLICATE Matrix :SOIL SOE ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301 12.695 2-Nitroaniline 2.13 U mg/Kg EPA 8270 09/17 10/25 GV Dimethylphthalate 2.13 U mg/Kg EPA 8270 09/17 10/25 GV Acenaphthylene 2.13 U mg/Kg EPA 8270 09/17 10/25 GV 2,6-Dinitrotoluene 2.13 U mg/Kg EPA 8270 09/17 10/25 GV 3-Nitroaniline 2.13 U mg/Kg **EPA 8270** 09/17 10/25 GV Acenaphthene 4.75 mg/Kg EPA 8270 09/17 10/25 GV 2.4-Dinitrophenol 2.13 U EPA 8270 mg/Kg 09/17 10/25 GV 4-Nitrophenol 4.10 mg/Kg EPA 8270 09/17 10/25 GV Dibenzofuran 2.13 mg/Kg EPA 8270 09/17 10/25 GV 2,4-Dinitrotoluene 2.38 mg/Kg EPA 8270 09/17 10/25 GV Diethylphthalate 2.13 Ħ mg/Kg **EPA** 8270 09/17 10/25 GV 4-Chlorophenyl-Phenylet 2.13 U mg/Kg EPA 8270 09/17 10/25 GV Fluorene 3.07 mg/Kg EPA 8270 09/17 10/25 GV 4-Nitroaniline 2.13 IJ mg/Kg EPA 8270 09/17 10/25 GV 4,6-Dinitro-2-Methylphe 2.13 Ü mq/Kq EPA 8270 09/17 10/25 GV n-Nitrosodiphenylamine 2.13 U mq/Kq EPA 8270 09/17 10/25 GV 4-Bromophenyl-Phenyleth 2.13 U mq/Kq EPA 8270 09/17 10/25 GV Hexachlorobenzene 2.13 U ma/Ka EPA 8270 09/17 10/25 GV Pentachlorophenol 0.251 J mq/Ka EPA 8270 09/17 10/25 GV Phenanthrene 2.13 U mg/Kg EPA 8270 09/17 10/25 **GV** Anthracene 2.13 U mg/Kg EPA 8270 09/17 10/25 GV di-n-Butylphthalate 10.3 В mg/Kg EPA 8270 09/17 10/25 **GV** Fluoranthene 2.13 11 mq/Kq EPA 8270 09/17 10/25 GV Pyrene 7.17 mg/Kg EPA 8270 09/17 10/25 GV Butylbenzylphthalate 2.13 [] mg/Kg EPA 8270 09/17 10/25 **GV** 3,3-Dichlorobenzidine 2.13 U ma/Ka EPA 8270 09/17 10/25 **GV** Benzo(a)Anthracene 2.13 U mg/Kq EPA 8270 09/17 10/25 **GV** Chrysene 2.13 mg/Kg EPA 8270 09/17 10/25 GV bis(2-Ethylhexyl)Phthal 4.25 mg/Kg EPA 8270 09/17 10/25 GV di-n-Octylphthalate 2.13 U mg/Kg EPA 8270 09/17 10/25 GV Benzo(b)Fluoranthene 2.13 09/17 10/25 mg/Kg EPA 8270 GV Benzo(k)Fluoranthene 2.13 mg/Kg **EPA** 8270 09/17 10/25 GV Benzo(a)Pyrene 2.13 U 09/17 10/25 mg/Kg EPA 8270 GV Indeno(1,2,3-cd)Pyrene 2.13 U mg/Kg EPA 8270 09/17 10/25 GV Dibenz(a,h)Anthracene 2.13 11 mg/Kg EPA 8270 09/17\10/25 GV Benzo(g,h,i)Perylene 2.13 11 mg/Kg EPA 8270 09/17 10/25 GV

See Special Instructions Above

See Sample Remarks Above

= Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed

LT = Less Than GT = Greater Than



SGS Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES



hrs

Chemlab Ref.#

:93.4693-4

REPORT of ANALYSIS

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343

Client Sample ID :LAY-AOC5-2509 Matrix :SOIL SSOP

WORK Order

FAX: (907) 561-5301

-

Client Name Ordered By

:ICF WAISER ENGINEERING :SHERI K ACE

:70764 Report Completed :11/09/93

Project Mame Project#

:DEWLINE RI/FS

Collected :09/07/93 @ 14:40

PWSID

:41095-412-01

Received :09/09/93 @ 12:00 hrs Technical Director: STEPHEN C. EDE

:UA

Released By : /

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. B = THIS FLAG IS USED WHEN THE

ANALYTE IS FOUND IN THE ASSOCIATED BLANK AS WELL AS IN THE SAMPLE. J = INDICATES AS ANALYTE WHOSE CONCENTRATION IS ESTIMATED BECAUSE THE

ANALYTE'S CONCENTRATION IS DETECTED BELOW THE CALIBRATION RANGE.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	a5.9		 ३	SM17 2540G				
Hydrocarbons EPH		D	-			00/14	09/10	
Hydrocarbons VPH		Ď		FPA 5030/01000		09/14	09/24	
Hydrocarbons EPH Hydrocarbons VPH Volatile Organics Benzene Bromobenzene Bromochloromethane Bromoform Bromomethane n-Butylbenzene tert-Butylbenzene tert-Butylbenzene Carbon Tetrachloride Chlorobenzene Chlorotenane Chloroform Chloromethane 2-Chlorotoluene Dibromochloromethane 12Dibromo3Chloropropane 1,2-Dibromoethane Dibromomethane 1,2-Dichlorobenzene 1,4-Dichlorobenzene 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethane 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethane 1,1-Dichloroethane 1,1-Dichloroethane 1,1-Dichloroethane 1,1-Dichloroethane	2.50 2.50 2.50 2.50 2.50 2.50 2.50 2.50	ממטממממממממממממממממ מ	mg/Kg mg/Kg	EPA 5030/8015M EPA 5030/8015M EPA 8260		09/10 09/10 09/10 09/10 09/10 09/10 09/10 09/10 09/10 09/10 09/10 09/10 09/10 09/10 09/10 09/10 09/10 09/10 09/10 09/10	10/01 10/01 10/01 10/01 10/01 10/01 10/01 10/01 10/01 10/01 10/01 10/01 10/01 10/01 10/01 10/01 10/01 10/01 10/01	EAL JES H KWM KWM KWM KWM KWM KWM KWM KWM KWM KWM
trans1,2-Dichloroethene	2.50	_	mg/Kg	EPA 8260 EPA 8260		09/10		KWM
1,2-Dichloropropane	2.50	•	mg/Kg	EPA 8260		09/10		
·		J 1	3\ 11A	EL N 0200		09/10 :	10/01	



COMMERCIAL TESTING & ENGINEERING CO. ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4693-4 Client Sample ID :LAY-A0C5-2S09 Matrix

:SOIL 5598

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

10012	, -			FAX: (907) 56	1.5301
1.3-Dichloropropane				,	
2.2-Dichloropropane	2 .50 ប		EPA 8260	39/10 10/01	
1,1-Dichloropropene	2.50 ປ	mg/Kg	EPA 8260	09/10 10/01	KW.
Ethylbenzene	2.50 ປ		EPA 8260	09/10 10/01	KW.
Hexachlorobutadiene	5.35 D		EPA 8260	09/10 10/01	KW!
Isopropylbenzene	2.50 U		EPA 8260	09/10 10/01	KWI
120broblinguzeue	- 3.23 D		EPA 8260	09/10 10/01	KW!
p-Isopropyltoluene	6.04 D	mg/Kg	EPA 8260	09/10 10/01	KW!
Methylene Chloride Napthalene	2 .50 ប	mg/Kg	EPA 8260	09/10 10/01	KWI
Napridiene	26.2 D	mg/Kg		09/10 10/01	KWI
n-Propylbenzene	7.88 D	mg/Kg	EPA 8260	09/10 10/01	KWt
Styrene	2 5 6	mg/Kg	EPA 8260	09/10 10/01	KWI
1112-Tetrachloroethane	2.50 U	mg/Kg	EPA 8260	09/10 10/01	KWI
1122-Tetrachloroethane	2.50 U		EPA 8260	09/10 10/01	KWŁ
Tetrachloroethene	2.50 y	mg/Kg	EPA 8260	09/10 10/01	KWP
Toluene	5.72 D	mg/Kg	EPA 8260	09/10 10/01	KWF
2.3-Trichlorobenzene	2.50 U	mg/Kg	EPA 8260	09/10 10/01	KWP
	2.50 U	mg/Kg	EPA 8260	09/10 10/01	KWP
i,i,l-Trichloroethane	2.50 U	mg/Kg	EPA 8260	09/10 10/01	KWM
1,1,2-Trichloroethana		mg/Kg	EPA 8260	09/10 10/01	KWM
irichioroethene	2 2 2	mg/Kg	EPA 8260	09/10 10/01	KWM
Trichlorofluoromethane		mg/Kg	EPA 8260	09/10 10/01	KWH
1,2,3-Trichloropropage	7.77	mg/Kg	EPA 8260	09/10 10/01	KWM
1,4,4-Trimethylbenzene	400	mg/Kg	EPA 8260	09/10 10/01	KWM
1,3,5-Trimethylbenzene		mg/Kg	EPA 8260	09/10 10/01	KWM
Vinyl Chloride	19.6 D	mg/Kg	EPA 8260	09/10 10/01	KWH
₽+m− Xylene	2.50 U	m g/K g	EPA 8260	09/10 10/01	KWM
o-Xylene	25.0 D	mg/Kg	EPA 8260	09/10 10/01	
	13.1 D	mg/Kg	EPA 8260	09/10 10/01	KWM
Semivolatile Organics				03710 10701	KWM
Phenol	2 22		EPA 8270		
bis(2-Chloroethyl)ether	2.28 U	mg/Kg	EPA 8270	09/17 10/26	C11
2-Chlorophenoi	2.28 U	m a/K g	EPA 8270	09/17 10/26	G V
1,3-Dichlorobenzene	2.28 U	mg/Kg	EPA 8270	09/17 10/26	G V
1,4-Dichlorobenzene	2.28 U	mg/Kg	EPA 8270	09/17 10/26	G V
Benzyl Alcohol	2.28 U	mg/Kg	EPA 8270	09/17 10/26	G V
1,2-Dichlorobenzene	2.28 U	mg/Kg	EPA 8270	09/17 10/26	G V
2-Methylphenol	2.28 U	mg/Kg	EPA 8270	09/17 10/26	G V
bis(2-Chloroisopropyl)e	2.28 U	mg/Kg	EPA 8270	09/17 10/26	G V
4-Methylphenol		mg/Kg	EPA 8270	09/17 10/26	G V
n-Nitroso-di-n-Propylam	2.28 U	mg/Kg	EPA 8270	09/17 10/26	G V
Hexachloroethane	2.28 U	mg/Kg	EPA 8270	09/17 10/26	G V
Nitrobenzene	2.28 U	mg/Kg	EPA 8270	09/17 10/26	G V
Isophorone	2 .28 U	mg/Kg	EPA 8270	09/17 10/26	- ·G V
2-Nitrophenol	2.28 U	mg/Kg	EPA 8270	09/17 10/26	G V
2,4-Dimethylphenol	2.28 U	mg/Kg	EPA 8270	09/17 10/26	G V
Benzoic Acid	2.28 U	mg/Kg	EPA 8270	09/17 10/26	G V
bis(2-Chloroethoxy)Meth	2.28 U	mg/Kg	EPA 8270	09/17 10/26	G V
2,4-Dichlorophenol	2.28 U	mg/Kg	EPA 8270	09/17 10/26	G V
1.2 4-Trichles	2.28 U	mg/Kg	EPA 8270	09/17 10/26	G V
1,2,4-Trichlorobenzene Naphthalene	2.28 U	mg/Kg	EPA 8270	09/17 10/26	G V
4-Chloroaniline	7.66	mg/Kg	EPA 8270	09/17 10/26	G V
. Cilloroaniline	2.28 U	mg/Kg	EPA 8270	09/17 10/26	G V
		פיי יכי	WA 02/0	09/17 10/26	GV



ENVIRONMENTAL LABORATORY SERVICES



REPORT of ANALYSIS Chemiab Ref.# :93.4693-4 Client Sample ID :LAY-AOC5-2509

:SOIL SSP8

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-23-3 FAX: (907) 561-5301

Hexachloroputadiene	2.28 U	mg/Kg	EPA 8270	00/17 10/06
4-Chloro-3-Methylphenol	2.28	mg/Kg	EPA 8270	09/17 10/26 GV
2-Methylnaphthalene	11.7	mg/Kg	EPA 8270	09/17 10/26 GV
Hexachlorocyclopentadie	2.28 U	mg/Kg	EPA 8270	09/17 10/26 GV
2.4.6-Trichlorophenol	2.28 U			09/17 10/26 GV
2,4,5-Trichlorophenol	2.28 U	mg/Kg	EPA 8270	09/17 10/26 GV
2-Chloronaphthalene	2.28 U	mg/Kg	EPA 8270	09/17 10/26 G V
2-Nitroaniline		mg/Kg	EPA 8270	09/17 10/26 GV
Dimethylphthalate		mg/Kg	EPA 8270	09/17 10/26 G V
Acenaphthylene	2.28 U	mg/Kg	EPA 8270	09/17 10/26 GV
2,6-Dinitrotoluene	2.28 U	mg/Kg	EPA 8270	09/17 10/26 GV
3-Nitroaniline	2.28 U	m g/K g	EPA 8270	09/17 10/26 GV
Acenaphthene	2.28 U	m g/K g	EPA 8270	09/17 10/26 G V
2 4-Dinitron	1.85 J	mg/Kg	EPA 8270	09/17 10/26 GV
2.4-Dinitrophenol 4-Nitrophenol	2.28 U	m g/K g	EPA 8270	09/17 10/26 GV
Gibenzoruran	2 .28 U	mg/Kg	EPA 8270	09/17 10/26 GV
oldenzoruran	1.83 J	mg/Kg	EPA 8270	09/17 10/26 GV
2.4-Dinitrotoluene	2.28 U	mg/Kg	EPA 8270	09/17 10/26 GV
Diethylphthalate	2.28 U	mg/Kg	EPA 8270	09/17 10/26 GV
4-Chlorophenyl-Phenylet Fluorene	2 .28 U	m g/K g	EPA 8270	09/17 10/26 GV
	1.95 J	m g/K g	EPA 8270	09/17 10/26 G V
4-Nitroaniline	2.28 U	m g/K g	EPA 8270	09/17 10/26GV
4.6-Dinitro-2-Methylphe	2 .28 U	mg/Kg	EPA 8270	
n-Nitrosodiphenylamine	2.28 U	mg/Kg	EPA 8270	09/17 10/26 V 09/17 10/26 V
4-Bromophenyl-Phenyleth	2 .28 U	mg/Kg	EPA 8270	09/17 10/26 GV
Hexachlorobenzene	2.28 U	mg/Kg	EPA 8270	09/17 10/26 G V
Pentachlorophenol	2.28 U	mg/Kg	EPA 8270	09/17 10/26 G V
Phenanthrene	2.44	mg/Kg	EPA 8270	09/17 10/26 GV
Anthracene	2.28 U	mg/Kg	EPA 8270	09/17 10/26 GV
di-n-Butylphthalate	8.48 B	mg/Kg	EPA 8270	09/17 10/26 GV
Fluoranthene	2. 28 U	mg/Kg	EPA 8270	09/17 10/26 GV
Pyrene	2.28 U	mg/Kg	EPA 8270	09/17 10/26 GV
Butylbenzylphthalate	2.28 🙂	mg/Kg	EPA 8270	09/17 10/26 GV
3.3-Dichlorobenzidine	2.28 U	mg/Kg	EPA 8270	09/17 10/26 GV
Benzo(a)Anthracene	2 .28 U	mg/Kg	EPA 8270	09/17 10/26 GV
Chrysene	2.28 U	mg/Kg	EPA 8270	09/17 10/26 GV
bis(2-Ethylhexyl)Phthal	2 .28 U	mg/Kg	EPA 8270	09/17 10/26 GV
di-n-Octylphthalate	2.28 U	mg/Kg	EPA 8270	09/17 10/26 GV
Benzo(b)Fluoranthene	2.28 U	mg/Kg	EPA 8270	09/17 10/26 GV
Benzo(k)Fluoranthene	2 .28 U	mg/Kg	EPA 8270	09/17 10/26 GV
Benzo(a)Pyrene	2 .28 U	mg/Kg	EPA 8270	09/17 10/26 GV
Indeno(1,2,3-cd)Pyrene	2 .28 U	mg/Kg	EPA 8270	09/17 10/26 GV
Dibenz(a,h)Anthracene	2.28 U	mg/Kg	EPA 8270	09/17 10/26 GV
Benzo(g,h,i)Perylene	2.28 U	mg/Kg	EPA 8270	09/17 10/26 GV
				03/11 10/20 GV

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed

LT = Less Than GT = Greater Than



See Special Instructions Above

^{**} See Sample Remarks Above

U = Undetected. Reported value is the practical quantification limit.



ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.#

:93.4693-5

REPORT of ANALYSIS

5633 B STREET ANCHORAGE, AK 99518

Matrix

Client Sample ID :LAY-A005-2510

:SOIL 5508

TEL: (907) 562-2343 FAX: (907) 561-5301

Client Name

:ICF KAISER ENGINEERING

Ordered By Project Name

:SHERI K ACE :DEWLINE RI/FS :41096-412-01

Project# PWSID

AU:

WORK Order

:70764

Report Completed :11/09/93 Collected

:09/07/93

@ 14:45 hrs

Received

:09/09/93 @ 12:00 hrs Technical Director: STEPHEN C. EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC

	Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	In it
	Percent Solids Hydrocarbons EPH	63.8 17500	ـــــــــــــــــــــــــــــــــــــ	% mg/Kg	SM17 2540G 3510/3550/8100M		09/14	09/10 09/21	EAL JBH
	VPH & BTEX Hydrocarbons VPH	2330	D	mg/Kg	EPA 8015M/8020 EPA 5030/8015m		09/10		WLS
•	Benzene Toluene Ethylbenzene p&m Xylene o-Xylene	4.00 12.4 18.2 60.2 31.4	<u>م</u> و	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	EPA 8020 EPA 8020 EPA 8020 EPA 8020 EPA 8020		09/10 09/10 09/10 09/10 09/10	09/17 09/17 09/17	WLS WLS WLS WLS

See Special Instructions Above See Sample Remarks Above

Undetected, Reported value is the practical quantification limit. \overline{D} = Secondary dilution.

UA = Unavailable

NA = Not Analyzed LT = Less Than

GT = Greater Than



Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4693-6

Client Sample ID :LAY-AOCS-2S10 SPIKE Matrix :SOIL

12.695

:ICF KAISER ENGINEERING

Ordered By Project Name

Client Name

:SHERI K ACE :DEWLINE RI/FS :41096-412-01

Project# PWSID

:UA

WORK Order

:70764 Report Completed :11/09/93

Collected Received

:09/07/93 @ 14:45 hrs :09/09/93 @ 12:00 hrs

5633 B STREET ANCHORAGE, AK 99518

EL: (907) 562-2343 FAX: (907) 561-5301

Technical Director: STEPHEN C. EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. FOR SPIKING CONCENTRATIONS AND

PERCENT RECOVERIES, SEE QA/QC PACKAGE.

Parameter	Results (QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Aromatics-BTEK Benzene Toluene Ethylbenzene p&m Xylene o-Xylene	178		mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	ADEC 18AAC 78 EPA 8020 EPA 8020 EPA 8020 EPA 8020 EPA 8020		09/10		WLS WLS WLS WLS

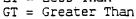
See Special Instructions Above

See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit. D = Secondary dilution.

UA = Unavailable NA = Not Analyzed

LT = Less Than







ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.#

:93.4693-7

5633 B STREET ANCHORAGE, AK 99518

TEL: (907) 562-2343

FAX: (907) 551-5301

Client Name

:ICF KAISER ENGINEERING :SHERI K ACE

WORK Order :70764

Ordered By Project Name

:DEWLINE RI/FS :41096-412-01

Report Completed :11/09/93

Project#

Collected :09/07/93 @ 14:45 hrs

PWSID

Received

:09/09/93 @ 12:00 hrs

:UA

Released By :

Technical Director: STEPHEN, C. EDE

Tomestea

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. FOR SPIKING CONCENTRATIONS AND

PERCENT RECOVERIES, SEE QA/QC PACKAGE.

 Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Aromatics-BTEK Benzene Toluene Ethylbenzene p&m Xylene o-Xylene	29.8 172 49.9 176 79.1	Ð	mg/Kg mg/Kg mg/Kg mg/Kg	ADEC 18AAC 78 EPA 8020 EPA 8020 EPA 8020 EPA 8020 EPA 8020		09/10 09/10 09/10	09/17 09/17 09/17 09/17 09/17	WLS WLS WLS

See Special Instructions Above

UA = Unavailable

See Sample Remarks Above U = Undetected, Reported value is the practical quantification limit.

NA = Not Analyzed

D = Secondary dilution.

LT = Less Than GT = Greater Than



SES Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemiab Ref.#

:93.4693-8 Client Sample ID :LAY-A0C5-2S11

Matrix

:SOIL SSP8

Client Name

Ordered By Project Name

:DEWLINE RI/FS

Project# PWSID

:UA

:ICF KAISER ENGINEERING

:SHERI K ACE

:41096-412-01

WORK Order :70764

Report Completed :11/09/93

Collected Received

:09/07/93 @ 14:45 hrs :09/09/93 @ 12:00 hrs

SESS B STREET ANCHORAGE, AK 99518

TEL: (907) 562-2343

FAX: (907) 561-5301

Technical Director: STEPHEN, C. EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC

 Parameter	Results	QC Quai	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids Hydrocarpons EPH	87.7 4.00	 -	³g∕Kg	SM17 2540G 3510/3550/8100M	***************************************	09/14	09/10 09/21	EAL JBH
VPH & BIEK Hydrocarbons VPH	0.500	ij	mg/Kg	EPA 8015M/8020 EPA 5030/8015m		09/10	09/17	WLS
Benzene Toluene Ethylbenzene p&m Xylene o-Xylene	0.025 0.025 0.025 0.025 0.025	ก ถ ถ	mg/Kg mg/Kg mg/Kg mg/Kg	EPA 8020 EPA 8020 EPA 8020 EPA 8020 EPA 8020		09/10 09/10 09/10 09/10 09/10	09/17 09/17 09/17	WLS WLS S S WLS

See Special Instructions Above

** See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit. D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed' LT = Less Than

GT = Greater Than



SSS Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref. =

:93.4693-9

Client Sample ID :LAY-A9C5-2512

Matrix

:SOIL SSZE

REPORT of ANALYSIS

SOUS B STREET ANCHORAGE, AK 99518

TEL: (907) 562-2343

FAX: (907) 561-5301

Client Name Ordered By

:ICF KAISER ENGINEERING

:SHERI K ACE

Project Name Project#

:DEWLINE RI/FS :41096-412-01

PWSID

AU:

WORK Order

Collected

Received

Report Completed

:70764

:11/09/93

:09/07/93 @ 15:00 hr: :09/09/93 @ 12:00 hr:

Technical Director: STEPHEN C. EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY:

SMF AND RCC. EPH PATTERN IS NOT CONSISTENT

WITH MIDDLE DISTILLATE FUEL.

	Parameter	Results Q	QC Qual Unit	s Method	Allowable Limits	Ext. Date	An al Date	In it
	Percent Solids Hydrocarbons EPH	83.9 10.5	m g∕k	SM17 2540G g 3510/3550/8100M		09/14	09/10 09/21	EAL JBH
	VPH & BTEX Hydrocarbons VPH	0.500	U mg/K	EPA 8015M/8020 EPA 5030/8015m		09/10	09/17	WLS
•	Benzene Toluene Ethylbenzene p&m Xylene o-Xylene	0.025 t 0.025 t 0.025 t	U mg/K U mg/K U mg/K	g EPA 8020 g EPA 8020 g EPA 8020		09/10 09/10 09/10 09/10 09/10	09/17 09/17 09/17	WLS WLS WLS WLS

See Special Instructions Above See Sample Remarks Above

= Undetected. Reported value is the practical quantification limit. D = Secondary dilution.

NA = Not Analyzed LT = Less Than GT = Greater Than

UA = Unavailable





ENVIRONMENTAL LABORATORY SERVICES



5633 B STREET ANCHORAGE, AK 99518

EL: (907) 562-2343

@ 14:50 hr:

FAX: (907) 551-5301

REPORT of ANALYSIS

Chemiab Ref.=

:93.4693-10 Client Sample ID :LAY-AOC5-2S15

Matrix

:SOIL SSOR

Client Name

Ordered By Project Name

Project# PWSID

:ICF KAISER ENGINEERING :SHERI K ACE

:DEWLINE RI/FS :41096-412-01

:UA

WORK Order

Report Completed :11/09/93 Collected

:09/07/93 Received

:09/09/93 @ 12:00 hr:

Technical Director: STEPHEN C. EDE

:70764

Released By :

Sample Remarks: SAMPLE COLLECTED BY: SMF AND RCC. EPH PATTERN IS NOT CONSISTENT

WITH MIDDLE DISTILLATE FUEL. B = THIS FLAG IS USED WHEN THE ANALYTE

IS FOUND IN THE ASSOCIATED BLANK AS WELL AS IN THE SAMPLE.

Percent Solids 30.3 % SM17 2540G Hydrocarbons EPH 4.19 mg/Kg 3510/3550/8100M 20/14/	09/10 EAL 09/21 JBF 09/18 WLE
	09/21 JBF
Hydrocarbons vpu	09/18 WLE
1.5. maying 51 k 3330,4013W (34)10 (
Volatile Organics EPA 8260	
Benzene 0.021 mg/kg $CDA 0.020$	10/01 KWM
promodenzene 0.020 il marka EDN 9260	
Bromochloromethane 0.020 H mg/kg FDA 9200	
Bromodichioromethane 0.020 H mg/kg FBA 8260	
Bromororm 0.020 II mg/kg FPA 9260	
Bromomethane 0.020 II mg/kg FDA 8260	
n-Butylbenzene 0.020 ii mg/kg EPA 9260	
sec-Butylbenzene 0.020 H mg/kg FPA 9260	
tert-Butylbenzne 0.020 H mg/kg FPA 8260	. –
Carbon Tetrachloride 0.020 U mg/kg EPA 9260	
Chlorobenzene 0.020 H mg/kg 530 8360	
Chloroethane 0.020 % rg/kg FRA 8260	
Chloroform 0.020 H mg/kg STBA 9260	
Chloromerhane 2 222	
7-[h] oroto) ueno	
4-Chlorotoluene 0.020 0 mg/kg EFR 0200 09/10 1	
Dibromochloromethana using kg EFR 8260 Us/10 I	
17Dibromo3Cb1oroproppo	
1,2-Dibromoethane 0.020 II mg/kg 579, 9260	
Dibromomerhana 09/10 1	
1.2-Dichloropages 09/10 1	
1,3-Dichlorobenzene 0.020 II mg/kg FDA 9260	
1.4-Dichloropoppe	
Dichlorodifluoromethane 0.020 ii mg/kg FPA 8260	
1 1-Dichloroophone	
1.7-Dichloroethana	
1.1-Dichloroethene	
Cis-1 2-Dichloropthone 09/10 1	
transi 2-Dichloroothone	
1.2-Dichloropropping 39/10 10	
3-Dichloroppen	
1,3-Dichioropropane 0.020 U mg/Kg EPA 8260 09/10 10	10/01



ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.#

REPORT of ANALYSIS

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

	Ref.#		:93.4693-10
Client	Sample	ID	:LAY-A065-2515
Matrix			:SOTT SSEE

2,2-Dichloropropane 0.020 # ma/Ka

- 1 - provitorobrobave	0 .020 ប	コペパンペ	CD8 0000		
1,1-Dichloropropene	0.020	mg/Kg	EPA 8260	09/10 10/01	KWM
Ethylbenzene		mg/Kg	EPA 8260	09/10 10/01	KWM
Hexachlorobutadiene	0.057	mg/Kg	EPA 8260	09/10 10/01	KWM
Isopropylbenzene	0.020 U	mg/Kg	SPA 8260	09/10 10/01	KWM
p-Isopropyltoluene	0.020 ਪ	mg/Kg	EPA 8260	09/10 10/01	KWM
Methylene Chloride	. 0.020 U	mg/Kg	EPA 8260	09/10 10/01	KWM
Napthalene	0 .020 ប	mg/Kg	EPA 8260	09/10 10/01	KWM
Naponatene	0.100	mg/Kg	EPA 8260	09/10 10/01	
n-Propylbenzene Styrene	0.023	mg/Kg	EPA 8260	09/10 10/01	KWM
1112 mahasasa	0.020 U	mg/Kg	EPA 8260	09/10 10/01	KWM
1112-Tetrachloroethane	0.020 ប	mg/Kg	EPA 8260		KWM
1122-Tetrachloroethane	0.020 ប	mg/Kg	EPA 8260	09/10 10/01	KWM
Tetrachloroethene	0.020 Ü	mg/Kg	EPA 6260	09/10 10/01	KWH
Toluene	0.240	mg/Kg	EPA 8260	09/10 10/01	KWM
1,2,3-Trichloropenzene	0.020 U	mg/Kg		09/10 10/01	KWM
1.4.4-Trichloropenzene	0.020		EPA 8260	09/10 10/01	KWM
-,1,1-Trichloroethane	0.020 g	mg/Kg	EPA 8260	09/10:10/01	KWM
1,1,2-Trichloroethane	0.020 U	mg/Kg	EPA 8260	09/10:10/01	KWM
Trichloroethene		mg/Kg	EPA 8260	09/10 !10/01	KWM
Trichlorofluoromethane		mg/Kg	EPA 8260	09/10 10/01	KWM
1,2,3-Trichloropropane		mg/Kg	EPA 8260	09/10/10/01	KWM
1,2,4-Trimethylbenzene	0.020 ປ	mg/Kg	EPA 8260	09/10 10/01	KWM
1.3.5-Trimethylbenzene	0.142	mg/Kg	EPA 8260	09/10 10/01	KWM
Vinyl Chloride	0.054	mg/Kg	EPA 8260	09/10 10/01	KWM
p+m-Xylene	0.020 U	mg/Kg	EPA 8260	09/10 10/01	KWM
o-Xylene	0.347	m g/K g	EPA 8260	09/10 10/01	KWM
•	0.153	mg∕K g	EPA 8260	09/10 10/01	KWM
Semivolatile Organics					
Phenoi			EPA 8270		
bis(2-Chloroethyl)ether	0.220 U	mg/Kg	EPA 8270	09/17 10/26	G V
2-Chlorophenoi	0.220 U	mg/Kg	EPA 8270	09/17 10/26	G V
1.3-Dichlorobenzene	0.220 U	mg/Kg	EPA 8270	09/17 10/26	G V
1.J-Dichioropenzene	0.220 y	mg/Kg	EPA 8270	09/17 10/26	
1,4-Dichloropenzene	0.220 U	mg/Kg	EPA 8270	09/17 10/26	G V
Benzyl Alcohol	0.220 U	mg/Kg	EPA 8270		GV
1,2-Dichlorobenzene	0.220 U	mg/Kg	EPA 8270	09/17 10/26	G V
2-Methylphenol	0.220 U	mg/Kg	EPA 8270	09/17 10/26	GV
bis(2-Chloroisopropyl)e	0.220 U	mg/Kg	EPA 8270	09/17 10/26	GV
4-Methylphenol	0 .220 U	mg/Kg	EPA 8270	09/17 10/26	GV
n-Nitroso-di-n-Propylam	0 .220 ប	mg/Kg	EPA 8270	09/17 10/26	GV
Hexachloroethane	0.220 ប៊	mg/Kg	EPA 8270	09/17 10/26	GV
Nitrobenzene	0.220 U	mg/Kg	EPA 8270	09/17 10/26	GV
Isophorone	0.220 U	mg/Kg	EPA 8270	09/17 10/26	- G V
2-Nitrophenol	0.220 U	mg/Kg		09/17 10/26	G V
2,4-Dimethylphenol	0.220 U		EPA 8270	09/17 10/26	G V
Benzoic Acid	0.220 U	mg/Kg	EPA 8270	09/17 10/26	G V
bis(2-Chloroethoxy)Meth	0.220 U	mg/Kg	EPA 8270	09/17 10/26	G V
2,4-Dichlorophenol	0.000	mg/Kg	EPA 8270	09/17 10/26	G V
1,2,4-Trichlorobenzene		mg/Kg	EPA 8270	09/17 10/26	G V
Naphthalene		mg/Kg	EPA 8270	09/17 10/26	G V
4-Chloroaniline		mg/Kg	EPA 8270	09/17 10/26	G V
Hexachlorobutadiene		mg/Kg	EPA 8270	09/17 10/26	G V
	0.22 0 U	mg/Kg	EPA 8270	09/17 10/26	G V





ENVIRONMENTAL LABORATORY SERVICES



REPORT	οf	ANA	LYS	TS
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Chemlab Ref.= :93.4693-10 Client Sample ID :LAY-AOC5-2815 Matrix :SOIL SS#8

5633 8 STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

4-Chloro-3-Methylphenol	0.220	U	mg/Kg	EPA 8	270	09/17	10/26	G V
2-Methylnaphthalene	0.220	ij	mg/Kg	EPA 8		09/17	10/26	G t
Hexachlorocyclopentadie	0.220	ij	mg/Kg	EPA 8		09/17	10/26	G t
2,4,6-Trichlorophenol	0.220	Ū	mg/Kg	EPA 8		09/17	10/26	G l
2,4,5-Trichlorophenol	0.220	Ü	mg/Kg	EPA 8		09/17	10/20	GV GV
2-Chloronaphthalene	0.220	Ü	mg/Kg	EPA 8		09/17	10/20	
2-Nitroaniline	0.220	Ü	ng/Kg	EPA 82		09/17	10/26	GV.
Dimethylphthalate	0.220	Ü	mg/Kg	EPA 82		09/17		GV
Acenaphthylene	0.220	Ü	mg/Kg	EPA 82		09/17		GV
2.6-Dinitrotoluene	0.220	Ŭ	mg/Kg	EPA 82				GV
3-Nitroaniline	0.220	ij	mg/Kg	EPA 82			10/26	GV
Acenaphthene	0.220	Ü	mg/Kg	EPA 82		09/17		GV
2,4-Dinitrophenol	0.220	IJ	mg/Kg	EPA 82		09/17		GV
4-Nitrophenol	0.220	IJ	mg/Kg	EPA 82		09/17		GV
Dibenzofuran	0.220	; ;				09/17		G V
2.4-Dinitrotoluene	0.220	J ::	mg/Kg	EPA 82		09/17		GV
Diethylphthalate	0.220	Ü	mg/Kg	EPA 82		09/17.		GV
4-Chlorophenyl-Phenylet	0.220	-	mg/Kg	EPA 82		09/17:		G V
Fluorene	0.220	Ü	mg/Kg	EPA 82		09/17!		G V
4-Nitroaniline	0.220	IJ	mg/Kg	EPA 82		09/17	10/26	G V
4,6-Dinitro-2-Methylphe	0.220	U	mg/Kg	EPA 82		09/17	10/26	G V
n-Nitrosodiphenylamine	0.220	U	mg/Kg	EPA 82		09/17	10/26	G V
4-Bromophenyl-Phenyleth	0.220	Ü	mg/Kg	EPA 82		09/17		GV
Hexachlorobenzene	0.220	U	mg/Kg	EPA 82		09/17		V
Pentachlorophenol	0.220	Ü	mg/Kg	EPA 82		09/17		GV
Phenanthrene	0.220	U U	mg/Kg	EPA 82		09/17		GV
Anthracene	0.220	U	mg/Kg	EPA 82		09/17		G V
di-n-Butylphthalate	1.95	_	mg/Kg	EPA 82		09/17		GV
Fluoranthene	0.220	В	mg/Kg	EPA 82		09/17		G V
Pyrene	0.220	U	mg/Kg	EPA 82		09/17		G V
Butylbenzylphthalate	0.220	U	m g/K g	EPA 82		09/17		G V
3.3-Dichlorobenzidine	0.220	IJ	mg/Kg	EPA 82		09/17		G V
Benzo(a) Anthracene		3	mg/Kg	EPA 82		09/17		G V
Chrysene	0.220	;	mg/Kg	EPA 82		09/17		G V
bis(2-Ethylhexyl)Phthal	0.220	Ü	mg/Kg	EPA 82		09/17		G V
di-n-Octylphthalate	0.220	U	mg/Kg	EPA 82		09/17		G V
Benzo(b)Fluoranthene	0.220	U	mg/Kg	EPA 82		09/17		G V
Benzo(k)Fluoranthene	0.220	U	mg/Kg	EPA 82		09/17	10/26	GV
Benzo(a)Pyrene	0.220	U	mg/Kg	EPA 82		09/17		G V
Indeno(1,2,3-cd)Pyrene	0.220	U	mg/Kg	EPA 82		09/17		GV
Dibenz(a,h)Anthracene		Ü	mg/Kg	EPA 82		09/17		G V
Benzo(g,h,i)Perylene		U	mg/Kg	EPA 82		09/17		- G V
v Syrry ayr chyheire	0.220	U	mg/Kg	EPA 82	/ U	09/17 1	10/26	G V

D = Secondary dilution.

UA = Unavailable: NA = Not Analyzed

LT = Less Than

GT = Greater_Than



SES Member of the SGS Group (Société Générale de Surveillance)

See Special Instructions Above

^{**} See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.



ENVIRONMENTAL LABORATORY SERVICES

hemlab Ref.# :93.4327-1

REPORT of ANALYSIS

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343

Client Sample ID :LAY-AOC5-SD01 POINT LAY Matrix :SOIL SSO

FAX: (907) 561-5301

Client Name

:ICF KAISER ENGINEERING

WORK Order Report Completed :10/08/93

:70058

Ordered By Project Name

:RAY MORRIS :DEW LINE RI/FS

Collected

:08/23/93 @ 13:30 hrs

Project#

:08/25/93 @ 12:00 hrs

Qualifici /Comment

PWSID

:41096-412-01 :UA

Received

Technical Director: STEPHEN C. EDE Released By:

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN.

					Ĺ	maryer /le	munes		
	Deno		QC		-	Allowable		Anal	
	Parameter	Results	Qual	Units	Method	Limits	Date	Date	Init
	Volatile Organics				EPA 8260				
	Benzene	0.250	บ	mg/Kg	EPA 8260(J	.) -1 1	09/26	09/05	W.C.W
	Bromobenzene	0.250	Ŭ	mg/Kg	EPA 8260 /) - 4 - 1		09/05	MCM MCM
	Bromochloromethane	0.250	Ü	mg/Kg	EPA 8260		00/20	09/05	
	Bromodichloromethane	0.250	Ü	mg/Kg	EPA 8260			09/05	MCM
	Bromoform	0.250	บั	mg/Kg	EPA 8260			09/05	MCM
	Bromomethane	0.250	Ü	mg/Kg	EPA 8260			09/05	MCM
	n-Butylbenzene	3.66	Ď	mg/Kg	EPA 8260			09/05	MCM
	sec-Butylbenzene	1.51	Ď	mg/Kg	EPA 8260				MCM
	tert-Butylbenzne	0.250	บั	mg/Kg	EPA 8260			09/05	MCM
	Carbon Tetrachloride	0.250	Ü	mg/Kg	EPA 8260			09/05	MCM
	Chlorobenzene	0.250	บั	mg/Kg	EPA 8260			09/05	MCM
_	Chloroethane	0.250	บั	mg/Kg	EPA 8260		00/20	09/05	MCM
	Chloroform	0.250	Ü	mg/Kg	EPA 8260			09/05	MCM
	Chloromethane	0.250	Ü	mg/Kg	EPA 8260			09/05	MCM
	2-Chlorotoluene	0.250	Ü	mg/Kg	EPA 8260			09/05	MCM
	4-Chlorotoluene	0.250	Ü	mg/Kg	EPA 8260			09/05	MCM
	Dibromochloromethane	0.250	Ü	mg/Kg	EPA 8260			09/05	MCM
	12Dibromo3Chloropropane	0.250	บ	mg/Kg	EPA 8260			09/05	MCM
	1,2-Dibromoethane	0.250	Ü	mg/Kg	EPA 8260		08/26		MCM
	Dibromomethane	0.250	Ü	mg/Kg	EPA 8260	İ		09/05 09/05	MCM
	1,2-Dichlorobenzene	0.250	Ü	mg/Kg	EPA 8260	1		09/05	MCM MCM
	1,3-Dichlorobenzene	0.250	บั	mg/Kg	EPA 8260		08/26		MCM
	1,4-Dichlorobenzene	0.250	ŭ	mg/Kg	EPA 8260			09/05	MCM
	Dichlorodifluoromethane	0.250	Ü	mg/Kg	EPA 8260		08/26		MCM
	1,1-Dichloroethane	0.250	Ū	mg/Kg	EPA 8260		08/26		MCM
	1,2-Dichloroethane	0.250	Ū	mg/Kg	EPA 8260	,	08/26		HCM
	1,1-Dichloroethene	0.250	Ū	mg/Kg	EPA 8260		08/26		MCM
	cis-1,2-Dichloroethene	0.250	Ū	mg/Kg	EPA 8260		08/26		HCM
	trans1,2-Dichloroethene	0.250	U	mg/Kg	EPA 8260		08/26		MCM
	1,2-Dichloropropane	0.250	U	mg/Kg	EPA 8260		08/26		MCM
	1,3-Dichloropropane	0.250	Ū	mg/Kg	EPA 8260		08/26		MCM
	2,2-Dichloropropane	0.250	U	mg/Kg	EPA 8260		08/26		HCM
	1,1-Dichloropropene	0.250	U	mg/Kg	EPA 8260		08/26		MCM
	Ethylbenzene	2.30	D	mg/Kg	EPA 8260		08/26		HCM
	Hexachlorobutadiene	0.250	U	mg/Kg	EPA 8260		08/26		MCM
	Isopropylbenzene	1.34	D	mg/Kg	EPA 8260		08/26		MCM
	p-Isopropyltoluene	1.45	D	mg/Kg	EPA 8260 🌂	,	08/26		MCM
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ENVIRONMENTAL LABORATORY SERVICES

ENVIRONMENTAL LAB	OHATOR	RY SERVICES				
SINCE 1908						Γ
,	RI	PORT of ANAL	YSIS LE	41101	5633 B STRE	r
Chemlab Ref.# :93.4327-1			1 /	ANCH	ORAGE, AK 99518 EL: (907) 562-2343	
Client Sample ID :LAY-AQC5-SD01	POINT	LAY	Budletini / Norm		AX: (907) 561-5301	
Matrix :SOIL SSØ8			- avanger of some			
Methylene Chloride 0	.250	J mg/Kg	EPA 8260 (J)-L.1	08/26	09/05 MC	м
		mg/Kg	EPA 8260 .		09/05 MC	
	2.81	J. J	EPA 8260 \		09/05 MC	
	.250		EPA 8260 \		09/05 MC	
		J mg/Kg	EPA 8260		09/05 MC	
		J mg/Kg	EPA 8260		09/05 MC	
	.250 t		EPA 8260		09/05 MC	
	2.11 I	3,	EPA 8260		09/05 MC	
	.250 t	J	EPA 8260		09/05 MC	
	.250 t		EPA 8260		09/05 MC	
			EPA 8260		09/05 MC	
			EPA 8260		09/05 MC	
			1			
	.250		EPA 8260			
	.250		EPA 8260		09/05 MC	
	.250 t	J J	EPA 8260		09/05 MC	
	13.9 I		EPA 8260		09/05 MC	
· ·	5.31 I	J	EPA 8260		09/05 MC	
	.250 t		EPA 8260		09/05 MC	
•	9.87 I 5.00 I		EPA 8260 ♥		09/05 MC	
o-Xylene	3.00 1) mg/Kg	EPA 8260 ♥	00/20	09/05 MCI	.1
Semivolatile Organics			EPA 8270			
Phenol 0	.240 t	J mg/Kg	EPA 8270	09/06	09/29	Ì
bis(2-Chloroethyl)ether 0	.240 t	J mg/Kg	EPA 8270	09/06	09/29	r
2-Chlorophenol 0	.240 t	J mg/Kg	EPA 8270	09/06	09/29 MT	ľ
1,3-Dichlorobenzene 0	.240 t	J mg/Kg	EPA 8270	09/06	09/29 MT	Γ
1,4-Dichlorobenzene 0	.240 (J mg/Kg	EPA 8270	09/06	09/29 MT	ſ
Benzyl Alcohol 0	.680	mg/Kg	EPA 8270	09/06	09/29 MT	Γ
1,2-Dichlorobenzene 0	.240 t	J mg/Kg	EPA 8270	09/06	09/29 MT	Γ
2-Methylphenol 0	.240 t		EPA 8270	09/06	09/29 MT	Γ
bis(2-Chloroisopropyl)e 0	.240 t	J mg/Kg	EPA 8270	09/06	09/29 MT	Γ
4-Methylphenol 0	.240 t		EPA 8270	09/06	09/29 MT	Γ
n-Nitroso-di-n-Propylam 0	.240 t		EPA 8270	09/06	09/29 MT	ſ
	.240 t	J mg/Kg	EPA 8270	09/06	09/29 MT	r
Nitrobenzene 0	.240 t		EPA 8270	09/06	09/29 MT	C
Isophorone 0	.240 t		EPA 8270	09/06	09/29 MTT	ľ
2-Nitrophenol 0	.240 t	J mg/Kg	EPA 8270	09/06		C
2,4-Dimethylphenol 0	.240 t	J mg/Kg	EPA 8270	09/06		
	.240 t	J mg/Kg	EPA 8270		09/29 MT	
	.240 t		EPA 8270	09/06		
	.240 t		EPA 8270	09/06	•	
	.240 t		EPA 8270	09/06		
	2.02	mg/Kg	EPA 8270	09/06		
	.240 t		EPA 8270	09/06		
	.240 t		EPA 8270	09/06		
4-Chloro-3-Methylphenol 0	.240 t	J mg/Kg	EPA 8270	09/06	09/29 MTT	ľ

2-3-94

.09/06 09/29

09/06 09/29

09/06 09/29

09/06 09/29

09/06 09/29

MTT

MTT

MTT



2-Methylnaphthalene

Hexachlorocyclopentadie

2,4,6-Trichlorophenol

2,4,5-Trichlorophenol

2-Chloronaphthalene

2.43

0.240

0.240

0.240

0.240

U

U

EPA 8270

EPA 8270

EPA 8270

EPA 8270

EPA 8270

mg/Kg

mg/Kg

mg/Kg

mg/Kg

mg/Kg



ENVIRONMENTAL LABORATORY SERVICES

S-NCE 1908							
Chemlab Ref.# :93.4327				ALYSIS SCE		ANCHORAGE.	STREET AK 99518
Client Sample ID :LAY-A00 Matrix :SOIL SS	55-SD01 POII Ø8		AY CARE			TEL: (907) FAX: (907)	562-2343
2-Nitroaniline	0.240	บ	到 mg/Kg 与	EPA 8270		00/06 00/0	
Dimethylphthalate	0.240	Ü	mg/Kg	EPA 8270		09/06 09/29	
Acenaphthylene	0.240	Ŭ	mg/Kg	EPA 8270		09/06 09/29 09/06 09/29	
2,6-Dinitrotoluene	0.240	Ū	mg/Kg	EPA 8270		09/06 09/29	
3-Nitroaniline	0.240	U	mg/Kg	EPA 8270		09/06 09/29	
Acenaphthene	0.240	U	mg/Kg	EPA 8270		09/06 09/29	HTT
2,4-Dinitrophenol	0.240	U	mg/Kg	EPA 8270		09/06 09/29	
4-Nitrophenol	0.240	U	mg/Kg	EPA 8270		09/06 09/29	
Dibenzofuran	0.240	U	mg/Kg	EPA 8270		09/06 09/29	
2,4-Dinitrotoluene Diethylphthalate	0.240	U	mg/Kg	EPA 8270		09/06 09/29	
4-Chlorophenyl-Phenylet	0.240	U	mg/Kg	EPA 8270		09/06 09/29	MTT
Fluorene		U	mg/Kg	EPA 8270		09/06 09/29	
4-Nitroaniline	0.240 0.240	U U	mg/Kg	EPA 8270		09/06 09/29	
4,6-Dinitro-2-Methylphe	0.240	U	mg/Kg mg/Kg	EPA 8270		09/06 09/29	
n-Nitrosodiphenylamine	0.240	Ü	mg/Kg	EPA 8270 EPA 8270		09/06 09/29	
4-Bromophenyl-Phenyleth	0.240	Ü	mg/Kg	EPA 8270		09/06 09/29	
Hexachlorobenzene	0.240	Ŭ	mg/Kg	EPA 8270		09/06 09/29 09/06 09/29	
Pentachlorophenol	0.240	U	mg/Kg	EPA 8270		09/06 09/29	
Phenanthrene	0.661		mg/Kg	EPA 8270		09/06 09/29	
Anthracene	0.240	U	mg/Kg	EPA 8270		09/06 09/29	
di-n-Butylphthalate Fluoranthene	0.240	U	mg/Kg	EPA 8270		09/06 09/29	
Pyrene	0.261	,,	mg/Kg	EPA 8270		09/06 09/29	MTT
Butylbenzylphthalate	0.240 0.240	U	mg/Kg	EPA 8270		09/06 09/29	
3,3-Dichlorobenzidine	0.240	U U	mg/Kg	EPA 8270		09/06 09/29	
Benzo(a)Anthracene	0.240	Ü	mg/Kg	EPA 8270		09/06 09/29	_
Chrysene	0.240	Ü	mg/Kg mg/Kg	EPA 8270 EPA 8270		09/06 09/29	
bis(2-Ethylhexyl)Phthal	0.441-1.000		mg/Kg	EPA 8270		09/06 09/29	
di-n-Octylphthalate	0.240	Ŭ	mg/Kg	EPA 8270		09/06 09/29 09/06 09/29	
Benzo(b)Fluoranthene	0.240	Ü	mg/Kg	EPA 8270		09/06 09/29	MTT MTT
Benzo(k)Fluoranthene	0.240	U	mg/Kg	EPA 8270		09/06 09/29	MTT
Benzo(a)Pyrene	0.240	U	mg/Kg	EPA 8270		09/06 09/29	MTT
Indeno(1,2,3-cd)Pyrene Dibenz(a,h)Anthracene	0.240	U	mg/Kg	EPA 8270		09/06 09/29	MTT
Benzo(g,h,i)Perylene	0.240	U	mg/Kg	EPA 8270		09/06 09/29	MTT
Sample Properties	`.aV U.a.Z4iU	Ü	mg/Kg	EPA 8270		09/06 09/29	MTT
Sample Preparation	1 m 22 at			TDN 2050 Diment			
Total Metals Analysis	OD			EPA 3050 Digest			
ICP Screen, ICF				EPA	n/a		
Aluminum	1700		mg/Kg	EPA 6010	11/ a	08/31 09/02	DLG
Antimony	56	U 3	5 mg/Kg 5.2	EPA 6010		08/31 09/02	DLG
Arsenic	56	U	mg/Kg	EPA 6010		08/31 09/02	DLG
Barium	330		mg/Kg	EPA 6010		08/31 09/02	DLG
Beryllium Cadmium	2.8	U	mg/Kg	EPA 6010		08/31 09/02	DLG
Calcium	2.8	U	mg/Kg	EPA 6010		08/31 09/02	DLG
Chromium	1200		mg/Kg	EPA 6010		08/31 09/02	DLG
Cobalt	4.7 5.6	U	mg/Kg	EPA 6010		08/31 09/02	DLG
Copper	7.1	U	mg/Kg	EPA 6010		08/31 09/02	DLG
Iron	21000		mg/Kg mg/Kg	EPA 6010		08/31 09/02	DLG
<u> </u>			₩ 3 \ 1\ 3	EPA 6010		08/31 09/02	DLG
				. 1	i i	1	d'Shef
				All changes so	U 2/2/91	t Consul	d. SMF
45				1.2. 0 11.	, 1 -	1 20.060	1.

SSS Member of the SGS Group (Société Générale de Surveillance)

Congiled: Stuf

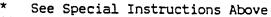


ENVIRONMENTAL LABORATORY SERVICES



Chemlab Ref.# :93.4327-1 Client Sample ID :LAY-A0C5-SD01 Matrix :SOIL	POIN	REPORT OF ANALY	sis Sec	5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301
Lead	5.6	U mg/Kg	EPA 6010	08/31 09/02 DLG
Magnesium	920	mg/Kg	EPA 6010	08/31 09/02 DLG
Manganese	200	J mg/Kg J. X	EPA 6010	08/31 09/02 DLG
Molybdenum	2.8	U mg/Kg	EPA 6010	08/31 09/02 DLG
Nickel	13	mg/Kg	EPA 6010	08/31 09/02 DLG
Potassium	420	پدِvmg/Kg مرب	EPA 6010	08/31 09/06 DLG
Selenium	56	U 4 mg/Kg 5/2	EPA 6010	08/31 09/06 DLG
Silver	28	UR mg/Kg J. 1	EPA 6010	08/31 09/06 DLG
Sodium	87	mg/Kg	EPA 6010	08/31 09/06 DLG
Thallium	0.29	U mg/Kg	EPA 7841	08/30 09/01 KAW
Vanadium	13	mg/Kg	EPA 6010	08/31 09/02 DLG
Zinc	44	mg/Kg	EPA 6010	08/31 09/02 DLG

All changes 2/2/94



** See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed

LT = Less Than GT = Greater Than





ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.# :93.4356-6

Client Sample ID :LAY-AOCS-SW01 POINT LAY

Matrix

:WATER SSOO

REPORT of ANALYSIS

5633 B STREET ANCHORAGE. AK 99518 TEL: (907) 562-2343

FAX: (907) 561-5301

Client Name Ordered By

:ICF KAISER ENGINEERING

Project Name Project#

:RAY MORRIS :DEW LINE RI/FS :41096-412-01

PWSID

:UA

WORK Order :70116

Report Completed :10/06/93 Collected :08/24/93

@ 11:00 hrs. Received :08/26/93 @ 12:00 hrs.

Technical Director: STEPHEN C, EDE

Released By : Spelligh

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	In i t
Volatile Organics								
Benzene	0.0070		19	EPA 8260				
Bromobenzene	0.0010		mg/L	EPA 8260			09/02	MCM
Bromochloromethane	0.0010	U	mg/L	EPA 8260			09/02	MCM
Bromodichloromethane	0.0010	U	mg/L	EPA 8260			09/02	MCM
Bromoform	0.0010	U	mg/L	EPA 8260			09/02	MCM
Bromomethane	0.0010	Ü	mg/L	EPA 8260			09/02	MCM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02		MCM
sec-Butylbenzene	0.0010	Ü	mg/L	EPA 8260			09/02	MCM
tert-Butylbenzne	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
bon Tetrachloride	0.0010	U U	mg/L	EPA 8260		09/02	09/02	MCM"
Lorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloroethane	0.0010	U	mg/L	EPA 8260		09/02		HCM
Chloroform	0.0010	u	mg/L	EPA 8260		09/02		MCM
Chloromethane	0.0010	U	mg/L	EPA 8260		09/02		MCM
2-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02		MCM
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260			09/02	MCM
Dibromochloromethane	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
12Dibromo3Chloropropane	0.0010	U	mg/L	EPA 8260		09/02		MCM
1,2-Dibromoethane	0.0010	_	mg/L	EPA 8260		09/02		MCM
Dibromomethane	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
1,2-Dichlorobenzene	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
1,3-Dichlorobenzene	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
1,4-Dichlorobenzene	0.0010	บ บ	mg/L	EPA 8260		09/02		MCM
Dichlorodifluoromethane	0.0010	_	mg/L	EPA 8260		09/02		MCM
1,1-Dichloroethane	0.0010	U U	mg/L	EPA 8260		09/02		MCM
1,2-Dichloroethane	0.0010	_	mg/L	EPA 8260		09/02		MCM
1,1-Dichloroethene	0.0010	Ŭ	mg/L	EPA 8260		09/02		MCM
cis-1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02		MCM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02		MCM
1,2-Dichloropropane	0.0010	U U	mg/L	EPA 8260		09/02		MCM
1,3-Dichloropropane	0.0010	-	mg/L	EPA 8260		09/02		MCM
2,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02		MCM
1,1-Dichloropropene	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
Ethylbenzene		U	mg/L	EPA 8260		09/02		MCM
Hexachlorobutadiene	0.0065 0.0010	**	mg/L	EPA 8260		09/02		MCM
Isopropylbenzene	0.0010	U	mg/L	EPA 8260		09/02		MCM
<u>p-</u> Isopropyltoluene	0.0012	**	mg/L	EPA 8260		09/02		MCM
Top Top Troine	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4356-6 Client Sample ID :LAY-A005-SW01 POINT LAY

Matrix :WATER 5508

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

			•			
Methylene Chloride	0.0010	Ū	mg/L	EPA 8260	09/02 09/02 1	HCM
Napthalene	0.015		mg/L	EPA 8260	09/02 09/02 1	MCM
n-Propylbenzene	0.0013		mg/L	EPA 8260	09/02 09/02 1	MCM
Styrene	0.0010	ប	mg/L	EPA 8260		MCM
1112-Tetrachloroethane	0.0010	U	mg/L	EPA 8260	· · · · · · · · · · · · · · · · · · ·	MCM
1122-Tetrachloroethane	0.0010	Ū	mg/L	EPA 8260		MCM
Tetrachloroethene	0.0010	Ü	mg/L	EPA 8260		MCM
Toluene	0.030	•	mg/L	EPA 8260		HCM
1,2,3-Trichlorobenzene	0.0010	U	mg/L	EPA 8260		HCM
1,2,4-Trichlorobenzene	0.0010	Ü	mg/L	EPA 8260		HCM
1,1,1-Trichloroethane	0.0010	บ	mg/L	EPA 8260	· · · · · · · · · · · · · · · · · · ·	MCM
1,1,2-Trichloroethane	0.0010	Ü			· · · · · · · · · · · · · · · · · · ·	
Trichloroethene	0.0010	_	mg/L	EPA 8260		1CM
Trichlorofluoromethane		Ü	mg/L	EPA 8260		HCM
	0.0010	Ü	mg/L	EPA 8260	•	1CM
1,2,3-Trichloropropane	0.0010	U	mg/L	EPA 8260	09/02 09/ 02 1	1CH
1,2,4-Trimethylbenzene	0.014		mg/L	EPA 8260	09/02 09/02 P	1CM
1,3,5-Trimethylbenzene	0.011		mg/L	EPA 8260	09/02 09/02 P	1CM
Vinyl Chloride	0.0010	U	mg/L	EPA 8260	09/02 09/02	1CM
p+m-Xylene	0.036		mg/L	EPA 8260	09/02 09/02	1CM
o-Xylene	0.030		mg/L	EPA 8260		1CM
			-			

* See Special Instructions Above

** See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed

LT = Less Than GT = Greater Than



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ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

hemlab Ref.#

:93.4354-1

Client Sample ID :LAY-AOCS-SW01 POINT LAY Matrix :WATER SSP8

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

Client Name

:ICF KAISER ENGINEERING

Ordered By

:RAY MORRIS

Project Name Project#

:DEW LINE RI/FS :41096-412-01

PWSID

:UA

WORK Order

:70106

Report Completed :10/07/93

Collected

:08/24/93 @ 11:00 hrs.

Received

:08/26/93 @ 12:00 hrs.

Technical Director: STEPHEN, C EDE

Released By : Man

						_	- 4	
Sample Remarks: SAMPLE COLL	ECTED BY: R	OBER	r c.c.	Qu'	rlifieri /Ce	mue	les	
Parameter	Results Q	QC Qual (Units		Allowable Limits		Anal	Init
Semivolatile Organics Phenol bis(2-Chloroethyl)ether 2-Chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene Benzyl Alcohol 1,2-Dichlorobenzene 2-Methylphenol bis(2-Chloroisopropyl)e 4-Methylphenol n-Nitroso-di-n-Propylam Hexachloroethane Nitrobenzene Isophorone 2-Nitrophenol 2,4-Dimethylphenol Benzoic Acid bis(2-Chloroethoxy)Meth	Results Q 0.017 0.017 0.017 0.017 0.017 0.017 0.017 0.017 0.017 0.017 0.017 0.017 0.017 0.017 0.017 0.017	v v v v v v v v v v v v v v v v v v v	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	Method EPA 8270	Limits	08/30 08/30 08/30 08/30 08/30 08/30 08/30 08/30 08/30 08/30 08/30 08/30 08/30	Date 09/06 09/06 09/06 09/06 09/06 09/06 09/06 09/06 09/06 09/06 09/06 09/06 09/06 09/06 09/06 09/06	Init MTT MTT MTT MTT MTT MTT MTT M
2,4-Dichlorophenol 1,2,4-Trichlorobenzene Naphthalene 4-Chloroaniline Hexachlorobutadiene 4-Chloro-3-Methylphenol 2-Methylnaphthalene Hexachlorocyclopentadie 2,4,6-Trichlorophenol 2-Chloronaphthalene 2-Nitroaniline Dimethylphthalate Acenaphthylene 2,6-Dinitrotoluene 3-Nitroaniline Acenaphthene 2,4-Dinitrophenol 4-Nitrophenol	0.017 0.017 0.017 0.017 0.017 0.017 0.017 0.017 0.017 0.017 0.017 0.017 0.017 0.017 0.017 0.017	טטטטטטטטטטטטטטטטטטטטטטטטטטטטטטטטטטטטטטט	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	EPA 8270 EPA 8270	-D.1	08/30 08/30 08/30 08/30 08/30 08/30 08/30 08/30 08/30 08/30 08/30 08/30	09/06 09/06 09/06 09/06 09/06 09/06 09/06 09/06 09/06 09/06 09/06 09/06	MIT MIT MIT MIT MIT MIT MIT MIT MIT MIT



SGS Member of the SGS Group (Société Générale de Surveillance)



COMMERCIAL TESTING & ENGINEERING CO. ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908		REPOR'	r of ANALY	SIS SK		
Chemlab Ref.# :93.4354-1					/ /	5633 B ST ANCHORAGE, AK TEL: (907) 562-2343 EAX: (907) 561-5301
Client Sample ID :LAY-AOC5-SW01	POIN	T LAY		(,), a (,	Door / Romi	TEL: (907) 562-23-13
Matrix :WATER SS\$				(Marci	Tree / Co non	X: (907) 561-5301
nact in				The same and	V	
Dibenzofuran .	0.017	บ	mg/L	EPA 8270	08	/30 09/06 MTT
2,4-Dinitrotoluene	0.017	U	mg/L	EPA 8270		/30 09/06 MTT
Diethylphthalate	0.017	Ū	mg/L	EPA 8270		/30 09/06 MTT
4-Chlorophenyl-Phenylet	0.017	บั	mg/L	EPA 8270		/30 09/06 MTT
Fluorene	0.017	Ü	mg/L	EPA 8270		/30 09/06 MTT
4-Nitroaniline	0.017	Ü	mg/L	EPA 8270		/30 09/06 MTT
4,6-Dinitro-2-Methylphe	0.017	-	mg/L	EPA 8270		/30 09/06 MTT
n-Nitrosodiphenylamine	0.017	Ü	mg/L	EPA 8270		/30 09/06 MTT
4-Bromophenyl-Phenyleth	0.017	Ü	mg/L	EPA 8270		/30 09/06 MTT
Hexachlorobenzene	0.017	Ū	mg/L	EPA 8270		/30 09/06 MTT
Pentachlorophenol	0.017	Ū	mg/L	EPA 8270		/30 09/06 MTT
Phenanthrene	0.017	Ü	mg/L	EPA 8270		/30 09/06 MTT
Anthracene	0.017	บั	mg/L	EPA 8270		/30 09/06 MTT
di-n-Butylphthalate	0.017	Ü	mg/L	EPA 8270		/30 09/06 MTT
Fluoranthene	0.017	Ü	mg/L	EPA 8270		/30 09/06 MTI
Pyrene	0.017	บั	mg/L	EPA 8270		/30 09/06 HTT
Butylbenzylphthalate	0.017	Ü	mg/L	FPA 8270	. 08	/30 09/06 MTT
3,3-Dichlorobenzidine	0.017	Ü	mg/L	EPA 8270 (J)-1).	/30 09/06 MTT
Benzo(a)Anthracene	0.017	Ü	mg/L	EPA 8270	08	/30 09/06 MTT
Chrysene	0.017	Ü	mg/L	EPA 8270		/30 09/06 HTT
bis(2-Ethylhexyl)Phthal	0.017	Ü	mg/L	EPA 8270		/30 09/06 MTT
di-n-Octylphthalate	0.017	Ü	mg/L	EPA 8270		/30 09/06 MTT
Benzo(b)Fluoranthene	0.017	Ü	mg/L	EPA 8270		/30 09/06 MTT
Benzo(k)Fluoranthene	0.017	-	mg/L	EPA 8270		
Benzo(a)Pyrene	0.017		mg/L	EPA 8270		/30 09/06 TT
Indeno(1,2,3-cd)Pyrene	0.017	Ü	mg/L	EPA 8270		/30 09/06 MTT
Dibenz(a,h)Anthracene	0.017	บั	mg/L	EPA 8270		/30 09/06 MTT
Benzo(g,h,i)Perylene	0.017		mg/L	EPA 8270		/30 09/06 MTT
belizo(g,ii, 1/1 c1)1ci.c	0.01	J	97 -2	2 020	•	, 50 0,, 60
Total Metals Analysis				_		
ICP Screen, ICF				EPA	n/a	
Aluminum	0.12		mg/L	EPA 6010		/02 09/06 DLG
Antimony	0.10	U	mg/L	EPA 6010		/02 09/06 DLG
Arsenic	0.10	U	mg/L	EPA 6010		/02 09/06 DLG
Barium	0.33		mg/L	EPA 6010	09	/02 09/06 DLG
Beryllium	0.10	U	mg/L	EPA 6010	09.	/02 09/06 DLG
Cadmium	0.050	U	mg/L	EPA 6010		/02 09/06 DLG
Calcium	57		mg/L	EPA 6010		/02 09/06 DLG
Chromium	0.050	U.	mg/L	EPA 6010	09,	/02 09/06 DLG
Cobalt	0.10	U	mg/L	EPA 6010	09,	/02 09/06 DLG
Copper	0.050	U	mg/L	EPA 6010		/02 09/06 DLG
Iron	6.3		mg/L	EPA 6010		/02 09/06 DLG
Lead	0.10	Ü	mg/L	EPA 6010		/02 09/06 DLG
Magnesium	29		mg/L	EPA 6010		/02 09/06 DLG
Manganese	0.61		mg/L	EPA 6010		/02 09/06 DLG
Molybdenum	0.050	บ	mg/L	EPA 6010		/02 09/06 DLG
Nickel	0.050	U	mg/L	EPA 6010		/02 09/06 DLG
Potassium	5.4		mg/L	EPA 6010		/15 09/17 DFL
Selenium	0.10	Ü	mg/L	EPA 6010		/02 09/06 DLG
Silver	0.050	U	mg/L	EPA 6010		/02 09/06 DLG
Sodium	28		mg/L	EPA 6010	09.	/15 09/17 DFL
				a.	ປ	
				(A)	74	

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ENVIRONMENTAL LABORATORY SERVICES

SINCE 1908	REPORT of ANAL	YSIS			
Chemlab Ref.# :93.4354- Client Sample ID :LAY-A0C5 Matrix :WATER Sol	1 -SW01 POINT LAY			5633 B STF ANCHORAGE, AK 9 TEL: (907) 562- FAX: (907) 561-	9518 2343
Thallium Vanadium Zinc	0.005 U mg/L 0.050 U mg/L 0.050 U mg/L	EPA 7841 EPA 6010 EPA 6010		09/03 09/08 09/02 09/06 09/15 09/17	BMI DLC DFL
Dissolved Metals Analys ICP Screen, ICF Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Molybdenum Nickel Potassium Selenium Silver Sodium Thallium Vanadium Zinc	0.10 U mg/L 0.10 U mg/L 0.10 U mg/L 0.27 mg/L 0.050 U mg/L 0.050 U mg/L 0.050 U mg/L 0.050 U mg/L 0.10 U mg/L 0.10 U mg/L 0.10 U mg/L 0.10 U mg/L 0.10 U mg/L 0.10 U mg/L 0.10 U mg/L 0.10 U mg/L 0.54 mg/L 0.050 U mg/L 0.050 U mg/L 0.050 U mg/L 0.050 U mg/L 0.050 U mg/L 0.050 U mg/L 0.050 U mg/L 0.050 U mg/L 0.050 U mg/L 0.050 U mg/L 0.050 U mg/L 0.050 U mg/L 0.050 U mg/L	EPA EPA 6010	n/a	09/02 09/06 09/15 09/17 09/03 09/08 09/02 09/06 09/15 09/17	DLG DLG DLG DLG DLG DLG DLG DLG DLG DLG
TOC, NonpurgableTOC RangeTOC Concentration	19.1-20.1 mg/L 19.6 mg/L	EPA 9060 EPA 9060 EPA 9060	n/a	09/07 09/07	CMR CMR
Residue, Non-Filterable Residue, Filterable (TDS)	23.5 G mg/L 596 J mg/L 4.1	EPA 160.2 EPA 160.1	500	08/30 08/31 09/01 09/02	GPP RJK
	oreguis: D.L. 1/4/94	All change	۲.۸ ک	2/2/94	

Compiled : Gul

UA = Unavailable

NA = Not Analyzed

LT = Less Than

GT = Greater Than



§ 565 Member of the SGS Group (Société Générale de Surveillance)

See Special Instructions Above

^{**} See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4354-3

Client Sample ID :LAY-AOC5-SW01 POINT LAY DUPLICATE Matrix :WATER Supplies

12695

Client Name

:ICF KAISER ENGINEERING

Ordered By

:RAY MORRIS

Project Name Project#

:DEW LINE RI/FS :41096-412-01

PWSID :UA WORK Order :70106

Report Completed :10/07/93

Collected Received

:08/24/93 @ 11:00 hrs. :08/26/93 @ 12:00 hrs.

5633 B STR

TEL: (907) 562-2343 FAX: (907) 561-5301

ANCHORAGE, AK 99518

Technical Director: STEPHEN C. EDE Released By:

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. METALS: SEE 9/17 RUN FOR DUP OF

NA, K, ZN. (93.4328-5)

 Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date		Init
Total Metals Analysis				-				
ICP Screen, ICF				EPA	n/a			
Aluminum	0.11		mg/L	EPA 6010		09/02	09/06	DLG
Antimony	0.10	U	mg/L	EPA 6010			09/06	DLG
Arsenic	0.10	U	mg/L	EPA 6010			09/06	DLG
Barium	0.33		mg/L	EPA 6010		09/02	09/06	DLG
Beryllium	0.050	U	mg/L	EPA 6010			09/06	DLG
Cadmium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Calcium	59		mg/L	EPA 6010		09/02	09/06	G
Chromium	0.050	· U	mg/L	EPA 6010		09/02	09/06	
Cobalt	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Copper	0.050	Ü	mg/L	EPA 6010		09/02	09/06	DLG
Iron	6.5		mg/L	EPA 6010		09/02	09/06	DLG
Lead	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Magnesium	28		mg/L	EPA 6010		09/02	09/06	DLG
Manganese	0.62		mg/L	EPA 6010		09/02	09/06	DLG
Molybdenum	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Nickel	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Potassium			mg/L	EPA 6010				
Selenium	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Silver	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Sodium			mg/L	EPA 6010				
Thallium	0.005	U	mg/L	EPA 7841		09/03	09/08	BMW
Vanadium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Zinc			mg/L	EPA 6010				
Dissolved Metals Analys								
ICP Screen, ICF				EPA	n/a			
Aluminum	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Antimony	0.10	Ü	mg/L	EPA 6010		09/02	09/06	DLG
Arsenic	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Barium	0.28		mg/L	EPA 6010		09/02	09/06	DLG
Beryllium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Cadmium	0.050	U	mg/L	EPA 6010		09/02		DLG
Calcium	58		mg/L	EPA 6010		09/02		DLG
Chromium	0.050	U	mg/L	EPA 6010		09/02		DLG
Cobalt	0.10	U	mg/L	EPA 6010		09/02	09/06	Dr. G
			- -	-		•		



ENVIRONMENTAL LABORATORY SERVICES

S-908				Cul			
Chemlab Ref.#	:93.4354-3	REPOR	et of an	ALYSIS SCA		5633 B ST	DEST
Client Sample ID	:LAY-AACS-SW01 POT	NT LAY	Dime +	C	ANCHO	DRAGE, AK	
Matrix	WATER SUP	NI LAI	DUPLI	CATE		EL: (907) 562 IX: (907) 561	
	12695				r#	w. (307) 361	-5501
Copper	0.050	U	mg/L	EPA 6010	00 (02	00.406	D.
Iron	0.10	Ū	mg/L		09/02	•	DL
Lead	0.10	Ü	_	EPA 6010	09/02		DL
Magnesium		U	mg/L	EPA 6010	09/02	09/06	DL
_	29		mg/L	EPA 6010	09/02	09/06	DL:
Manganese	0.55		mg/L	EPA 6010	09/02		DL(
Molybdenum	0.050	U	mg/L	EPA 6010	09/02		
Nickel	0.050	U	mg/L	EPA 6010			DL:
Potassium		•	_		09/02	09/06	DL(
Selenium		••	mg/L	EPA 6010			
Silver	0.10	Ŭ	mg/L	EPA 6010	09/02	09/06	DLC
	0.050	U	mg/L	EPA 6010	09/02		DLC
Sodium			mg/L	EPA 6010	03,02	03,00	
Thallium	0.005	U	mg/L	EPA 7841	00.403	00.400	516
Vanadium	0.050	Ü	-		09/03		BM
Zinc	0.030	J	mg/L	EPA 6010	09/02	09/06	DLC
			חרד / T	FBX 6010			

mg/L

EPA 6010

See Special Instructions Above

** See Sample Remarks Above

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u = Undetected, Reported value is the practical quantification limit. D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed

LT = Less Than GT = Greater Than



SSS Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

3 % 2 E 9 2 B

REPORT of ANALYSIS

Chemlab Ref.# :93.4354-2

Client Sample ID :LAY-A0C3-SW01 FOINT LAY SPIKE Matrix :WATER 5508

:ICF KAISER ENGINEERING Client Name

Ordered By :RAY MORRIS Project Name : DEW LINE RI/FS

Project# :41096-412-01

PWSID

WORK Order :70106

Report Completed :10/07/93 Collected

:08/24/93 @ 11:00 hrs :08/26/93 @ 12:00 hrs Received

5533 B STA ANCHORAGE, AK 99518

TEL: (907) 562-2343 FAX: (907) 561-5301

Technical Director: STEPHEN G. EDE,

Released By :

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. METALS: SEE 93.4328-5 FOR SPIKE FOR NA, K, ZN.

QC Allowable Ext. Anal Parameter Results Qual Units Method Limits Date Date Tnit Semivolatile Organics EPA 8270 0.092 mg/L EPA 8270 08/30 09/06 bis(2-Chloroethyl)ether 0.017 ប EPA 8270 mg/L 08/30 09/06 MIT 2-Chlorophenol 0.133 EPA 8270 ma/L 08/30 09/06 HTT 1,3-Dichlorobenzene 0.017 ប mq/L EPA 8270 08/30 09/06 MTT 0.107 1,4-Dichlorobenzene mg/L EPA 8270 08/30 09/06 MTT 0.017 ប EPA 8270 Benzyl Alcohol mg/L 08/30 09/06 MIT 1,2-Dichlorobenzene 0.017 U EPA 8270 mg/L 08/30 09/06 MTT 2-Methylphenol 0.017 U mg/L EPA 8270 08/30 09/06 bis(2-Chloroisopropyl)e 0.017 U mg/L EPA 8270 08/30 09/06 EPA 8270 EPA 8270 EPA 8270 EPA 8270 EPA 8270 EPA 8270 4-Methylphenol 0.017 U mg/L 08/30 09/06 n-Nitroso-di-n-Propylam 0.148 mg/L 08/30 09/06 MTT Hexachloroethane 0.017 U mg/L 08/30 09/06 MTT 0.017 U mg/L 0.017 U mg/L 0.017 U mg/L 0.017 U mg/L 0.017 U mg/L 0.017 U mg/L 0.017 U mg/L 0.017 U mg/L Nitrobenzene 08/30 09/06 MTT Isophorone 08/30 09/06 MTT 2-Nitrophenol 08/30 09/06 MTT 2,4-Dimethylphenol EPA 8270 08/30 09/06 MIT Benzoic Acid EPA 8270 08/30 09/06 MTT bis(2-Chloroethoxy)Meth 0.017 U EPA 8270 08/30 09/06 MTT 2,4-Dichlorophenol EPA 8270 08/30 09/06 MTT 1,2,4-Trichlorobenzene 0.122 EPA 8270 mg/L 08/30 09/06 mg/L mg/L mg/L Naphthalene 0.017 U EPA 8270 08/30 09/06 MTT 4-Chloroaniline 0.017 U EPA 8270 08/30 09/06 MTT Hexachlorobutadiene EPA 8270 0.017 0.159 08/30 09/06 MTT 4-Chloro-3-Methylphenol mg/L EPA 8270 08/30 09/06 MTT 2-Methylnaphthalene mg/L mg/L EPA 8270 0.017 08/30 09/06 MTT Hexachlorocyclopentadie EPA 8270 0.017 [] 08/30 09/06 MTT 2,4,6-Trichlorophenol 0.017 EPA 8270 U mg/Ĺ 08/30 09/06 MTT 2,4,5-Trichlorophenol 0.017 EPA 8270 U mg/L 08/30 09/06 MTT 2-Chloronaphthalene 0.017 U EPA 8270 mg/L 08/30 09/06 MTT 2-Nitroaniline . 0.017 U mg/L EPA 8270 08/30 09/06 MTT Dimethylphthalate 0.017 U mg/L EPA 8270 08/30 09/06 MTT 0.017 U mg/L Acenaphthylene EPA 8270 08/30 09/06 MTT 2,6-Dinitrotoluene 0.017 U mg/L EPA 8270 08/30 09/06 MTT 3-Nitroaniline 0.017 U mg/L EPA 8270 08/30 09/06 MTT Acenaphthene 0.154 mg/L EPA 8270 08/30 09/06 MTT 2,4-Dinitrophenol 0.017 ប mg/L EPA 8270 08/30 09/06



COMMERCIAL TESTING & ENGINEERING CO. ENVIRONMENTAL LABORATORY SERVICES

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	chemlab Ref.# :93.4354-2		REPORT	r of analy	SIS			5533 D CT	
-	Client Sample ID :LAY-ASC3-SWO	1 2011	100 2 5 17				ANCHO	5 533 B ST: DRAGE, AK 9	7518
	Matrix :WATER 8508	1 1011	NT LAY	SPIKE			7	EL: (907) 562	-2343
	Sul Digg	_					FA	X: (907) 561	.5301
	4-Nitrophenol	0.080		/ =					
	Dibenzofuran		• •	mg/L	EPA 8270		08/30		MTT
	2,4-Dinitrotoluene	0.017	Ü	mg/L	EPA 8270		08/30		MIT
	Diethylphthalate	0.134	11	mg/L	EPA 8270		08/30		MTT
	4-Chlorophenyl-Phenylet	0.017	U	mg/L	EPA 8270		08/30		MTT
	Fluorene	0.017	Ü	mg/L	EPA 8270		08/30		MTT
	4-Nitroaniline	0.017	Ü	mg/L	EPA 8270		08/30		MTT
	4,6-Dinitro-2-Methylphe	0.017	บ	mg/L mg/L	EPA 8270		08/30		MTT
	n-Nitrosodiphenylamine	0.017	Ü	mg/L	EPA 8270		08/30		MTT
	4-Bromophenyl-Phenyleth	0.017	Ü	mg/L	EPA 8270		08/30		MTT
	Hexachlorobenzene	0.017	Ü	mg/L	EPA 8270 EPA 8270		08/30		MTT
	Pentachlorophenol	0.063	J	mg/L	EPA 8270		08/30		MTT
	Phenanthrene	0.017	U	mg/L	EPA 8270		08/30		MTT
	Anthracene	0.017	Ü	mg/L	EPA 8270		08/30		MTT
	di-n-Butylphthalate	0.088	J	mg/L	EPA 8270		08/30		MTT
	Fluoranthene	0.017	U	mg/L	EPA 8270		08/30		MTT
	Pyrene	0.169	_	mg/L	EPA 8270		08/30 08/30		MTT
	Butylbenzylphthalate	0.017	U	mg/L	EPA 8270		08/30		MTT
	3,3-Dichlorobenzidine	0.017	Ü	mg/L	EPA 8270		08/30		MTT MTT
	Benzo(a)Anthracene	0.017	Ü	mg/L	EPA 8270		08/30		MTT
	Chrysene	0.017	Ŭ	mg/L	EPA 8270		08/30		MTT
	bis(2-Ethylhexyl)Phthal	0.017	U	mg/L	EPA 8270		08/30		MTT
	di-n-Octylphthalate	0.017	U	mg/L	EPA 8270		08/30		MTT
	Benzo(b)Fluoranthene	0.017	Ü	mg/L	EPA 8270		08/30		MTT
	Benzo(k)Fluoranthene	0.017	U	mg/L	EPA 8270		08/30		MTT
	Benzo(a)Pyrene	0.017	Ü	mg/L	EPA 8270		08/30		MTT
	Indeno(1,2,3-cd)Pyrene	0.017	U	mg/L	EPA 8270		08/30		MTT
	Dibenz(a,h)Anthracene	0.017	U	mg/L	EPA 8270		08/30		MTT
	Benzo(g,h,i)Perylene	0.017	U	mg/L	EPA 8270		08/30		MTT
	Total Metals Analysis								
	ICP Screen. ICF				-				
	Aluminum	1 1 4		/r	EPA	n/a			
	Antimony	1.14 0.87		mg/L	EPA 6010		09/02		DLG
	Arsenic	0.87		mg/L	EPA 6010		09/02		DLG
	Barium	1.32		mg/L	EPA 6010		09/02		DLG
	Beryllium	0.39		mg/L	EPA 6010		09/02		DLG
	Cadmium	0.47		mg/L mg/L	EPA 6010 EPA 6010		09/02		DLG
	Calcium	67		mg/L	EPA 6010		09/02		DLG
	Chromium	0.97		mg/L	EPA 6010		09/02		DLG
	Cobalt	0.93		mg/L	EPA 6010		09/02		DLG
	Copper	0.95		mg/L	EPA 6010		09/02		DLG
	Iron	7.3		mg/L	EPA 6010		09/02 09/02		DLG
	Lead	0.89		mg/L	EPA 6010		09/02		DLG
	Magnesium	39		mg/L	EPA 6010		09/02		DLG DLG
	Manganese	1.59		mg/L	EPA 6010		09/02		DLG
	Molybdenum	0.97		mg/L	EPA 6010		09/02		DLG
	Nickel	0.95		mg/L	EPA 6010		09/02		DLG
	Potassium			mg/L	EPA 6010		0 27 0 2	0 // 0 0	
	Selenium	0.90		mg/L	EPA 6010		09/02	09/06	DLG
	Silver	0.15		mg/L	EPA 6010		09/02		DLG
	\			-			/	- 2, 40	220





ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.# :93.4354	RE	PORT OF ANA	LYSIS		5633 B S	
Client Sample ID :LAY-AOC Matrix :WATER	5-SW01 POINT	LAY SPIKE			ANCHORAGE: AF TEL: (907) 56 FAX: (907) 56	(99518 52-2343
Sodium	2.695	75. mg/f				
Thallium	0.016	mg/L mg/L	EPA 6010 EPA 7841		00 (00 00 100	
Vanadium	0.94	mg/L	EPA 7841 EPA 6010		09/03 09/08	
Zinc		mg/L	EPA 6010		09/02 09/06	DLG
Dissolved Metals Analys			_			
ICP Screen, ICF			EPA	n/a		
Aluminum	1.08	mg/L	EPA 6010	, -	09/02 09/06	DLG
Antimony	0.89	mg/L	EPA 6010		09/02 09/06	DLG
Arsenic	0.93	mg/L	EPA 6010		09/02 09/06	DLG
Barium	1.27	mg/L	EPA 6010		09/02 09/06	DLG
Beryllium	0.39	mg/L	EPA 6010		09/02 09/06	DLG
Cadmium	0.48	mg/L	EPA 6010		09/02 09/06	DLG
Calcium	67	mg/L	EPA 6010		09/02 09/06	DLG
Chromium	0.98	mg/L	EPA 6010		09/02 09/06	DLG
Cobalt	0.96	mg/L	EPA 6010		09/02 09/06	DLG
Copper	0.97	mg/L	EPA 6010		09/02 09/06	DLG
Iron	1.04	mg/L	EPA 6010		09/02 09/06	DLG
Lead	0.92	mg/L	EPA 6010		09/02 09/06	DLG
Magnesium 	38	mg/L	EPA 6010		09/02 09/06	DLG
Manganese	1.55	mg/L	EPA 6010		09/02 09/06	DLG
Molybdenum	0.98	mg/L	EPA 6010		09/02 09/06	DLG
Nickel	0.96	mg/L	EPA 6010		09/02 09/06	G
Potassium		mg/L	EPA 6010			
Selenium	0.90	mg/L	EPA 6010		09/02 09/06	DLG
Silver	0.091	mg/L	EPA 6010		09/02 09/06	DLG
Sodium		mg/L	EPA 6010			
Thallium	0.016	mg/L	EPA 7841		09/03 09/08	BMW
Vanadium	0.95	mg/L	EPA 6010		09/02 09/06	DLG
Zinc		mg/L	EPA 6010			

** See Sample Remarks Above

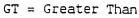
U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed

LT = Less Than





See Special Instructions Above



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

pemlab Ref.# :93.4354-11

Alient Sample ID :LAY-AOCS-SW01 POINT LAY SPIKE DUPLICATE :WATER SW01 POINT LAY SW01 POINT LAY SPIKE DUPLICATE :WATER SW01 POINT LAY SW01 POINT L

Matrix

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

Client Name Ordered By

:ICF KAISER ENGINEERING

Project Name

:RAY MORRIS :DEW LINE RI/FS

Project# PWSID

:41096-412-01 :UA

WORK Order :70106

Report Completed :10/07/93

Collected :08/24/93 @ 11:00 hrs Received :08/26/93 @ 12:00 hrs

Technical Director: STEPHEN C. EDE Released By : Stephen C.

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C.

Semivolatile Organics	Parameter	QC Results Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
4-Nitrophenol 0.107 mg/L EPA 8270 08/30 09/06 MTT	Semivolatile Organics Phenol bis(2-Chloroethyl)ether 2-Chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene Benzyl Alcohol 1,2-Dichlorobenzene 2-Methylphenol bis(2-Chloroisopropyl)e 4-Methylphenol n-Nitroso-di-n-Propylam Hexachloroethane Nitrobenzene Isophorone 2-Nitrophenol 2,4-Dimethylphenol Benzoic Acid bis(2-Chloroethoxy)Meth 2,4-Dichlorophenol 1,2,4-Trichlorobenzene Naphthalene 4-Chloro-3-Methylphenol 2-Methylnaphthalene Hexachlorocyclopentadie 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronaphthalene 2-Nitroaniline Dimethylphthalate Acenaphthylene 2,6-Dinitrotoluene 3-Nitroaniline Acenaphthene 2,4-Dinitrophenol	0.108 0.019 0.154 0.019 0.103 0.019		EPA 8270 EPA 8270	Limits	08/30 08/30	09/06 09/06	#TT #TT #TT #TT #TT #TT #TT #TT #TT #TT



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS :93.4354-11 Chemlab Ref.# 5633 B 5 ANCHORAGE, AK Client Sample ID :LAY-AOCS-SW01 POINT LAY SPIKE DUPLICATE TEL: (907) 562-2343 :WATERSEE FAX: (907) 561-5301 12695 Dibenzofuran 0.019 mg/L EPA 8270 08/30 09/06 MT. 2,4-Dinitrotoluene 0.186 mq/L EPA 8270 08/30 09/06 Diethylphthalate 0.019 U EPA 8270 mg/L 08/30 09/06 MT. 4-Chlorophenyl-Phenylet 0.019 U mg/L EPA 8270 08/30 09/06 MT Fluorene 0.019 U mg/L EPA 8270 08/30 09/06 MT. 4-Nitroaniline 0.019 [] mg/L EPA 8270 08/30 09/06 MT. 4,6-Dinitro-2-Methylphe 0.019 U mg/L EPA 8270 08/30 09/06 MT n-Nitrosodiphenylamine 0.019 Ü mg/L EPA 8270 08/30 09/06 MT. 4-Bromophenyl-Phenyleth 0.019 mg/L EPA 8270 08/30 09/06 MTI Hexachlorobenzene 0.019 EPA 8270 mg/L 08/30 09/06 MTT Pentachlorophenol 0.079 EPA 8270 mg/L 08/30 09/06 MIT Phenanthrene 0.019 11 mg/L **EPA** 8270 08/30 09/06 MTT Anthracene 0.019 U mg/L EPA 8270 08/30 09/06 MIT di-n-Butylphthalate 0.113 mg/L EPA 8270 08/30 09/06 MTT Fluoranthene 0.019 mg/L EPA 8270 08/30 09/06 MTT Pyrene 0.183 mg/L EPA 8270 08/30 09/06 MTT Butylbenzylphthalate 0.019 H mg/L EPA 8270 08/30 09/06 MTT 3,3-Dichlorobenzidine 0.019 U mg/L **EPA** 8270 08/30 09/06 MTT Benzo(a)Anthracene 0.019 U mg/L EPA 8270 08/30 09/06 MTT Chrysene 0.019 U mg/L EPA 8270 08/30 09/06 MTT bis(2-Ethylhexyl)Phthal 0.019 U mg/L EPA 8270 08/30 09/06 MTT di-n-Octylphthalate 0.019 U mg/L EPA 8270 08/30 09/06 MTT Benzo(b)Fluoranthene 0.019 U mg/L EPA 8270 08/30 09/06 MTT .Benzo(k)Fluoranthene 0.019 · U mg/L EPA 8270 08/30 09/06 II Benzo(a)Pyrene 0.019 U mg/L EPA 8270 08/30 09/06 TT Indeno(1,2,3-cd)Pyrene 0.019 U mg/L EPA 8270 08/30 09/06 MTT Dibenz(a,h)Anthracene 0.019 U mg/L EPA 8270 08/30 09/06 MTT Benzo(q,h,i)Perylene 0.019 U mg/L EPA 8270 08/30 09/06 MTT

UA = Unavailable

NA = Not Analyzeg

LT = Less Than

GT = Greater Than



SSS Member of the SGS Group (Société Générale de Surveillance)

See Special Instructions Above

See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

	SCOR	rc no	C 00	(C n t
ICF ID	<i>5</i> SØరీ LAY- AOC 5-S01	LAY- AQC 5-S02	<i>S</i> SØ8 LAY- AOC5 -S03	55Øరీ LAY- AOC5 -S04
F&BI Number	417	419	421	423
Sample Type	soil	soil	soil	soil
Date Received	8/24/93	8/24/93	8/24/93	8/24/93
% Dry Weight	93	97	96	89
Sequence Date	#5-08/24/93	#5-08/24/93	#5-08/24/93	#5-08/24/93
Leaded Gas				
JP-4	< 50	<50	< 50	< 50
Lube Oil	<100	<100	<100	< 100
Diesel	-5400 7200	< 50	< 50	< 50
Spike Level				
Unknown Semi-volatile				
Pentacosane	99	120	79	111
Sequence Date	#5-08/24/93	#5-08/24/93	#5-08/24/93	#5-08/24/93
PCB 1221	< 0.1	< 0.1	< 0.1	< 0.1
PCB 1232	< 0.1	< 0.1	< 0.1	< 0.1
PCB 1016	< 0.1	< 0.1	< 0.1	< 0.1
PCB 1242	< 0.1	< 0.1	< 0.1	< 0.1
PCB 1248	< 0.1	< 0.1	< 0.1	< 0.1
PCB 1254	< 0.1	< 0.1	< 0.1	< 0.1
PCB 1260	< 0.1	< 0.1	< 0.1	< 0.1
Spike Level				
Dibutyl Chlorendate	88	90	89	80
Sequence Date	#5-08/24/93			
alpha-BHC	<0.02 5			
beta-BHC	<0.02 \(\mathcal{J} \)			
gamma-BHC	<0.02 조			
delta-BHC	<0.02 五			
Heptachlor	<0.02 J			
Aldrin	<0.02 \\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			
Heptachlor Epoxide	<0.02 7			
Endosulfan I	<0.02 5			
DDE Dialdaia	<0.02 5			
Dieldrin Endrin	< 0.02 \(\tau \)			
Endrin Endosulfan II	<0.02 プ <0.02 J			
DDD	<0.023			
Endrin Aldehyde	<0.023			
DDT	<0.023			
Endosulfan Sulfate	<0.02 J			
Endrin Ketone	<0.02 3			
Methoxy Chlor	ع.م. کم. <u>ح</u>	. 2		
Chlordane	< 0.5 3			
Dibutyl Chlorendate	88			
Spike Level				
Vol Sequence	#1&2-08/24/93	#3&4-08/27/93	#3&4-08/27/93	#3&4-08/27/93
CCI4	< 0.02	< 0.02	< 0.02	< 0.02
TCA	< 0.02	< 0.02	< 0.02	< 0.02
Benzene	0.26 R	< 0.02	< 0.02	< 0.02
TCE	< 0.02	< 0.02	< 0.02	< 0.02
Toluene	1.8 R	< 0.02	< 0.02	< 0.02
PCE	< 0.02	< 0.02	< 0.02	< 0.02
Ethylbenzene	12 R	< 0.02	< 0.02	< 0.02
Xylenes	19 R	< 0.04	< 0.04	< 0.04
Gasoline	550 diesel 3	<2 3	<2 5	<2 5
Spike level	_		_	•
BFB	100	104	136	110

C58 6-14-95

ICF ID	<i>SSQ1</i> 6 LAY- AOC5 -S05	<i>55</i> 28 LAY- AOC5- S06	<i>క</i> ≤ల8 LAY- A0C5- S06	్ర≲్థ8 LAY -AOC5 -S06	8mp
F&BI Number	425	427	427 dup	427 ms	6.14.91
Sample Type	soil	soil	soil	soil	
Date Received	8/24/93	8/24/93	8/24/93	8/24/93	
% Dry Weight	93	85	87	-,	_
Sequence Date	#5-08/24/93	#5-08/24/93	#5-08/24/93	#5-08/24/93	
Leaded Gas		• • • • • • • • • • • • • • • • • •			
JP-4	<50	< 50	<50		
Lube Oil	<100	<100	<100		
Diesel	<50	2200 2900	1700	92	
Spike Level	100	2200,		500	
Unknown Semi-volatile					
Pentacosane	95	82	91	95	
Sequence Date	#5-08/24/93	#5-08/24/93	#5-08/24/93	#5-08/24/93	
PCB 1221	<0.1	<0.1	<0.5 <0.1		
PCB 1232	<0.1	<0.1	< 0.5 < 0.1		
PCB 1016	<0.1	<0.1	<0.5 ∠o.1		
PCB 1242	<0.1	<0.1	<0.5 40.1		
PCB 1248	<0.1	<0.1	< 0.5 <0.1		
PCB 1254	<0.1	<0.1	< 0.5 40.1	120	
PCB 1260	<0.1	<0.1	<0.5 <0.1		
Spike Level	\0.1	70.1	10.0	5	
Dibutyl Chlorendate	91	93	103	120	
Sequence Date	01	00	100	•	
alpha-BHC					
beta-BHC					
gamma-BHC					
delta-BHC					
Heptachlor					
Aldrin					
Heptachlor Epoxide					
Endosulfan I					
DDE					
Dieldrin					
Endrin					
Endosulfan II					
DDD					
Endrin Aldehyde					
DDT					
Endosulfan Sulfate					
Endrin Ketone					
Methoxy Chlor					
Chlordane					
Dibutyl Chlorendate					
Spike Level					
Vol Sequence	#3&4-08/27/93	#1&2-08/24/93	#1&2-08/24/93	#1&2-08/24/93	
CCI4	< 0.02	< 0.02	< 0.02		
TCA	< 0.02	< 0.02	< 0.02		
Benzene	< 0.02	1.4	0.8	102	
TCE	< 0.02	< 0.02	< 0.02		
Toluene	< 0.02	2.8	2.2		
PCE	< 0.02	< 0.02	< 0.02		
Ethylbenzene	< 0.02	11 5	11		4
Xylenes	< 0.04	22 丁	20		
Gasoline	<2 J	330 diesel J	16		
Spike level	_	3		1	
BFB	120	106	102	102	2 - 18
					6-14-95
					•

	a 00	.55Ø8	~~	~~~
ICF ID	<i>5</i> 508 LAY- AOC5 -S06	LAY- AOC5- S07	<i>S</i> SØ8 LAY- A0 €5-SD01	SSOB LAY-AGC5-SD02 AND
F&BI Number	427 msd	429	463	465 6.19.9)
Sample Type	soil	soil	soil	soil
Date Received	8/24/93	8/24/93	8/24/93	8/24/93
% Dry Weight		90	88	7
Sequence Date	#5-08/24/93	#5-08/24/93	#5-08/25/93	#5-08/25/93
Leaded Gas				
JP-4		< 50	<60	< 750
Lube Oil		<100	120	<1500
Diesel	101	5400 7200	1500 1100	2800 < 700
Spike Level	500			
Unknown Semi-volatile				
Pentacosane	110	92	100	102
Sequence Date	#5-08/24/93	#5-08/24/93	#5-08/25/93	#5-08/25/93
PCB 1221		<0.1	~0. 5 <0.1	£40 < 1.5
PCB 1232 PCB 1016		<0.1	< 0. 5 40.1	<10 <1.5
PCB 1016		<0.1 <0.1	<0.5 ⟨0.1	510 < 1.5 510 < 1.5
PCB 1242 PCB 1248		<0.1	< 0. 5 ⟨०.। <0. 5 ⟨०.।	\$10 21.5 \$10 41.5
PCB 1254	120	<0.1	<0.5 ∠0.1	<10 <1.5
PCB 1260	120	<0.1	<0.5 < 0.1 <0.5 < 0.1	<10 <1.5
Spike Level	5	\0.1	70.5 70.1	210 21.3
Dibutyl Chlorendate	130	103	102	101
Sequence Date	.00	#5-08/24/93	102	101
alpha-BHC		<0.02 3		
beta-BHC		< 0.02 3		
gamma-BHC		<0.02 J		
delta-BHC		<0.02 J		
Heptachlor		<0.02 3		
Aldrin		<0.02 ブ		
Heptachlor Epoxide		<0.02 J		
Endosulfan I		<0.02 স		
DDE		<0.02 \(\pi \)		
Dieldrin		<0.02 J		
Endrin		<0.02 J		
Endosulfan II		<0.02 \(\)		
DDD Endrin Aldehyde		<0.02 \(\mathcal{I} \)		
DDT		<0.02 5		
Endosulfan Sulfate		<0.02 J		
Endrin Ketone		<0.02 J		
Methoxy Chlor		<0.02 C	2	
Chlordane		< 0.5 3	_	
Dibutyl Chlorendate		103		
Spike Level				
Vol Sequence	#1&2-08/24/93	#1&2-08/24/93	#1&2-08/24/93	#1&2-08/24/93
CCI4		< 0.02	<0.02 5	<0.29
TCA		< 0.02	<0.02 ブ	<0.29
Benzene		< 0.02	0.23 ブ	<0.29
TCE		< 0.02	<0.02 J	<0.29
Toluene		1.7 R	1	3.4 <0.29
PCE		< 0.02	< 0.02 \(\mathcal{Z} \)	<0.29
Ethylbenzene		14 R	1.9	7.8 40.29
Xylenes		34 R	7.7 5	28. C 0.57
Gasoline	4	470 diesel プ	46 J	48 4 2 3
Spike level	1	00	447	440
BFB	103	98	117	112 የን ፄ
				C-14-32
				•

	57.70	£5-0	\$600
ICF ID	<i>S</i> ⇒Ø8 LAY- AOC 5-SD03	<i>SS</i> Ø8 LAY- AØC5 -SW01	SSØ8 LAY- AOÓ 5-SW01
F&BI Number	467	573	576
Sample Type	soil	water	water
Date Received	8/24/93	8/25/93	8/25/93
% Dry Weight	26	0/23/30	0/20/00
Sequence Date	#5-08/25/93	#5-08/27/93	
Leaded Gas	#3-00/23/33	#3'00/27/33	
JP-4	< 200	<1000	
Lube Oil	<400	<2000	
Diesel	<200	<1000	
Spike Level	~200	1000	
Unknown Semi-volatile			
Pentacosane	97	60	
Sequence Date	#5-08/25/93	#5-08/27/93	
PCB 1221	#3 00/20/00 ≤2 <0.4	<2	
PCB 1232	52 40.4	<2	
PCB 1232 PCB 1016	\$2 40.4	<2	
	\$2 40.4	<2	
PCB 1242	-		
PCB 1248	<2 < 0.4 82 < 0.4	<2	
PCB 1254	615	<2	
PCB 1260	<2 40.4	<2	
Spike Level		54	
Dibutyl Chlorendate	94	51	
Sequence Date			
alpha-BHC			
beta-BHC			
gamma-BHC			
delta-BHC			
Heptachlor			
Aldrin			
Heptachlor Epoxide	•		
Endosulfan I			
DDE			
Dieldrin			
Endrin			
Endosulfan II			
DDD			
Endrin Aldehyde			
DDT			
Endosulfan Sulfate			
Endrin Ketone			
Methoxy Chlor			
Chlordane			
Dibutyl Chlorendate			
Spike Level	"00 4 00 (07 (00		#0.8.4.00./0F./00
Vol Sequence	#3&4-08/27/93		#3&4-08/25/93
CCI4	< 0.08		<1
TCA	< 0.08		<1
Benzene	< 0.08		AT 15
TCE	< 0.08		<1
Toluene	< 0.08		43
PCE	< 0.08		<1
Ethylbenzene	< 0.08		ST 12 J
Xylenes	< 0.16		48 82 3
Gasoline	<2 5		550 L100 J
Spike level			
BFB	116		96

		0.00	Ce ma	
	ICF ID	LAY-A005-SW02	55000 LAY- A005 -SW02	Suf
	F&BI Number	577	578	6,495
	Sample Type	water	water	O(pis
	Date Received	8/25/93	8/25/93	
	% Dry Weight			
	Sequence Date	#5-08/27/93		
,	Leaded Gas			
	JP-4	<1000		
	Lube Oil	< 2000		
	Diesel	<1000		
	Spike Level			
	Unknown Semi-volatile			
	Pentacosane	116		
	Sequence Date	#5-08/27/93		
	PCB 1221	<2		
	PCB 1232	<2		
	PCB 1016	<2		
	PCB 1242	<2		
	PCB 1248	<2		
	PCB 1254	<2		
	PCB 1260	<2		
	Spike Level	0.0		
	Dibutyl Chlorendate	96		
	Sequence Date alpha-BHC			
	beta-BHC			
	gamma-BHC			
	delta-BHC			
	Heptachlor			
	Aldrin			
	Heptachlor Epoxide			
	Endosulfan I			
	DDE			
	Dieldrin			
	Endrin			
	Endosulfan II			
	DDD			
	Endrin Aldehyde			
	DDT			
	Endosulfan Sulfate			
	Endrin Ketone			
	Methoxy Chlor			
	Chlordane			
	Dibutyl Chlorendate			
	Spike Level			
	Vol Sequence		#3&4-08/25/93	
	CCI4		<1	
	TCA		<1	
	Benzene TCE		<1	
	Toluene		<1	
	PCE		<1	
	Ethylbenzene		<1	
	Xylenes		<1 <2	
	Gasoline		<50 <100 J	
	Spike level		500	~~
	opike level		22	RJB

92

BFB

ANALYTICAL DATA SHEETS FOR BACKGROUND (BKGD)



ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.#

:93.4327-6

REPORT of ANALYSIS

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343

Client Sample ID :LAY-BKGD-S01 POINT LAY

FAX: (907) 561-5301

Matrix

:SOIL

Client Name Ordered By

:ICF KAISER ENGINEERING :RAY MORRIS

WORK Order :70058

Project Name Project#

:DEW LINE RI/FS :41096-412-01

Report Completed :10/08/93 Collected

Released By :

PWSID

Received

:08/23/93 @ 14:40 hrs :08/25/93 @ 12:00 hrs

C. Eds.

:UA

Technical Director: STEPHEN_C. EDE

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN. DETECTION LIMIT FOR 8270 IS DUE TO THE FACT THAT THE SAMPLE FORMED THE HIGH A THICK SLUDGE WHEN CONCENTRATED DOWN TO 1.0 ML, IT NEEDED TO BE

Parameter	QC Results Qual Units	Method	Allowable Limits		An al Da te	Init
Volatile Organics Benzene Bromobenzene Bromochloromethane Bromochloromethane Bromoform Bromomethane n-Butylbenzene sec-Butylbenzene tert-Butylbenzene Carbon Tetrachloride Chlorobenzene Chlorotoluene Chloroform Chloromethane 2-Chlorotoluene d-Chlorotoluene Dibromochloromethane 1,2-Dibromosthane 1,2-Dibromoethane 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,1-Dichloroethane 1,1-Dichloroethane 1,1-Dichloroethene 1,2-Dichloroethene 1,2-Dichloropane 1,1-Dichloropane 1,2-Dichloropane 1,1-Dichloropane 1,2-Dichloropane 1,2-Dichloropane 1,2-Dichloropane 1,2-Dichloropropane 1,3-Dichloropropane 1,1-Dichloropropane 1,1-Dichloropropane 1,1-Dichloropropane 1,1-Dichloropropane 1,1-Dichloropropane 1,1-Dichloropropane Ethylbenzene	0.150 U mg/Kg 0.150 U mg/Kg	EPA 8260 EPA 8260		08/26 08/26	09/05 09/05	HCH HCH HCH HCH HCH HCH HCH HCH HCH HCH



ENVIRONMENTAL LABORATORY SERVICES

S-NGE 1908							
Chemlab Ref.# :93.4327-6 Client Sample ID :LAY-BKGD-S01	POIN			ALYSIS SET		5633 8 ANCHORAGE, A TEL: (907)	AK
Matrix :SOIL			Comment			FAX: (907)	561-5301
2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronaphthalene 2-Nitroaniline Dimethylphthalate Acenaphthylene 2,6-Dinitrotoluene 3-Nitroaniline Acenaphthene 2,4-Dinitrophenol 4-Nitrophenol Dibenzofuran 2,4-Dinitrotoluene	10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0	ט ט ט ט ט ט ט ט ט	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	EPA 8270 EPA 8270 EPA 8270 EPA 8270 EPA 8270 EPA 8270 EPA 8270 EPA 8270 EPA 8270 EPA 8270 EPA 8270 EPA 8270 EPA 8270 EPA 8270		09/06 09/30 09/06 09/30 09/06 09/30 09/06 09/30 09/06 09/30 09/06 09/30 09/06 09/30 09/06 09/30 09/06 09/30 09/06 09/30	MTT HTT HTT HTT HTT HTT HTT HTT
Diethylphthalate	10.0	U	mg/Kg	EPA 8270		09/06 09/30	MTT
4-Chlorophenyl-Phenylet Fluorene 4-Nitroaniline 4,6-Dinitro-2-Methylphe	10.0 10.0 10.0 10.0	U U U	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	EPA 8270 EPA 8270 EPA 8270 EPA 8270 EPA 8270		09/06 09/30 09/06 09/30 09/06 09/30 09/06 09/30 09/06 09/30	MTT MTT MTT
n-Nitrosodiphenylamine	10.0	Ü	mg/Kg	EPA 8270		09/06 09/30	MTT
4-Bromophenyl-Phenyleth Hexachlorobenzene Pentachlorophenol	10.0 10.0 10.0	บ บ บ	mg/Kg mg/Kg mg/Kg	EPA 8270 EPA 8270 EPA 8270		09/06 09/30 09/06 09/30	MTT MTT
Phenanthrene	10.0	Ü	mg/Kg	EPA 8270		09/06 09/30 09/06 09/30	MIT
Anthracene di-n-Butylphthalate	10.0 10.0	บ บ	mg/Kg mg/Kg	EPA 8270 EPA 8270		09/06 09/30 09/06 09/30	
Fluoranthene Pyrene	10.0	U	mg/Kg	EPA 8270		09/06 09/30	MTT
Butylbenzylphthalate	10.0 10.0	U U	mg/Kg mg/Kg	EPA 8270		09/06 09/30	MTT
3,3-Dichlorobenzidine	10.0	บ	mg/Kg	EPA 8270 EPA 8270		09/06 09/30 09/06 09/30	MTT MTT
Benzo(a)Anthracene	10.0	U	mg/Kg	EPA 8270		09/06 09/30	MTT
Chrysene bis(2-Ethylhexyl)Phthal	10.0	U	mg/Kg	EPA 8270		09/06 09/30	MTT
di-n-Octylphthalate	10.0 10.0	U U	mg/Kg	EPA 8270		09/06 09/30	MTT
Benzo(b)Fluoranthene	10.0	บ	mg/Kg mg/Kg	EPA 8270 EPA 8270		09/06 09/30 09/06 09/30	MTT
Benzo(k)Fluoranthene	10.0	Ü	mg/Kg	EPA 8270		09/06 09/30	MTT
Benzo(a)Pyrene Indeno(1,2,3-cd)Pyrene	10.0		mg/Kg	EPA 8270		09/06 09/30	MTT
Dibenz(a,h)Anthracene	10.0	U U	mg/Kg	EPA 8270		09/06 09/30	MTT
Benzo(g,h,i)Perylene	10.0	Ü	mg/Kg mg/Kg	EPA 8270 EPA 8270		09/06 09/30 09/06 09/30	MTT MTT
Sample Preparation Total Metals Analysis			E	IPA 3050 Digest			
ICP Screen, ICF Aluminum	22000		100	EPA	n/a		
Antimony	23000 115	υJ	mg/Kg mg/Kg ^j ,z	EPA 6010 EPA 6010		08/31 09/02	DLG
Arsenic	115	บั	mg/Kg	EPA 6010		08/31 09/02 08/31 09/02	DLG DLG
Barium Beryllium	390		mg/Kg	EPA 6010		08/31 09/02	DLG
Cadmium	5.7 5.7	U U	mg/Kg	EPA 6010		08/31 09/02	DLG
Calcium	2500	U	mg/Kg mg/Kg	EPA 6010 EPA 6010		08/31 09/02 08/31 09/02	DLG
Chromium	37		mg/Kg	EPA 6010		08/31 09/02	DLG DLG
				All charges	۸۱.	2/2/94	
					J4. —	-1 - 1 1 1	

§ SGS Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.# Client Sample ID Matrix	:93.4327-6 :LAY-BKGD-S01 :SOIL	POINT	REPORT of ANI	•	EC.		5633 B ST HORAGE, AK TEL: (907) 562 FAX: (907) 561	99518 2-2343
Cobalt		11	U mg/Kg	EPA	6010	08/31	09/02	DLG
Copper Iron		20	mg/Kg	EPA	6010	08/31	09/02	DLG
Lead		35000	mg/Kg	EPA	6010	08/31	09/02	DLG
Magnesium		20	√ mg/Kg		6010	08/31	09/02	DLG
Manganese		4300	mg/Kg J.		6010		09/02	DLG
Molybdenum		97 4			6010	08/31	09/02	DLG
Nickel		5.7	U mg/Kg		6010	08/31	09/02	DLG
Potassium		26	mg/Kg		6010		09/02	DLG
Selenium		1500	ung/Kg	/ ٦	6010		09/06	DLG
Silver		115	0 2/m3/Kg -	EPA	6010		09/02	DLG
Sodium		57	UR mg/KgJ.		6010		09/02	DLG
Thallium		170	mg/Kg		6010		09/06	KAW
Vanadium		0.57	U mg/Kg		7841		09/01	KAW
Zinc		56	mg/Kg		6010		09/02	DLG
220		46	mg/Kg	EPA	6010	08/31	09/02	DLG
TOC, Soil		69300	mg/Kg	PSEP R	ef Lab			•

All charges ne statat

See Special Instructions Above See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit. D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed -

LT = Less Than GT = Greater Than



REPORT of ANALYSIS

ENVIRONMENTAL LABORATORY SERVICES



Chemlab Ref.# :93.4327-7

Client Sample ID :LAY-BKGD-S02 POINT LAY

:SOIL

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

Matrix

Project Name : DEW LINE RI/FS

PWSID

Client Name :ICF KAISER ENGINEERING Ordered By :RAY MORRIS

Project# :41096-412-01

WORK Order

:70058

Report Completed :10/08/93

Received

Collected :08/23/93 @ 15:10 hrs

Received :08/25/93 @ 12:00 hrs Technical Director:STEPHEN C. EDE,

Released By : Star 6, 9/1

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN. THE HIGH DETECTION LIMIT FOR 8270 IS DUE TO THE FACT THAT THE SAMPLE FORMED A THICK SLUDGE WHEN CONCENTRATED DOWN TO 1.0 ML, IT NEEDED TO BE DILUTED.

OC Allowable Ext. Anal Parameter Results Qual Units Method Limits Date Date Init Volatile Organics EPA 8260 Benzene mg/Kg EPA 8260 mg/Kg EPA 8260 mg/Kg EPA 8260 mg/Kg EPA 8260 0**.07**0 ប Bromobenzene Bromochloromethane
Bromochloromethane
Bromodichloromethane
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Browl 08/26 09/05 MCM 0**.070** U Bromochloromethane 08/26 09/05 MCM 0.070 ប 08/26 09/05 MCM 08/26 09/05 08/26 09/05 08/26 09/05 08/26 09/05 MCM 08/26 09/05 MCM 08/26 09/05 HCM 08/26 09/05 MCM 08/26 09/05 MCM 08/26 09/05 MCM 08/26 09/05 MCM 08/26 09/05 MCM 08/26 09/05 MCM 08/26 09/05 08/26 09/05 08/26 09/05 MCM 08/26 09/05 MCM 08/26 09/05 MCM 08/26 09/05 MCM 08/26 09/05 MCM 08/26 09/05 Dichloroull Lucional

1,1-Dichloroethane

1,2-Dichloroethene

1,1-Dichloroethene

cis-1,2-Dichloroethene

trans1,2-Dichloroethene

1,2-Dichloropropane

1,3-Dichloropropane

2,2-Dichloropropane

1,1-Dichloropropane

1,1-Dichloropropene

2,2-Dichloropropene

2,2-Dichloropropene

1,1-Dichloropropene

Ethylbenzene

0.070 U mg/Kg
0.070 U mg/Kg
0.070 U mg/Kg MCM 08/26 09/05 MCM 08/26 09/05 MCM 08/26 09/05 HCH 08/26 09/05 MCM 08/26 09/05 MCM 08/26 09/05 08/26 09/05 08/26 09/05 MCM MCM MCM 08/26 09/05 MCM EPA 8260 08/26 09/05 EPA 8260 08/26 09/05





ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.# :93.4327-	- /		ANALYSIS XX		5633 B ANCHORAGE, A	STREET
Client Sample ID :LAY-BKGD Matrix :SOIL	D-S02 POINT L	AY			TEL: (907) 5 FAX: (907) 5	562-2343
2,4,6-Trichlorophenol	15.0 U	m g/K g	FPA 8270			
2,4,5-Trichlorophenol	15.0 U	2, 2			09/06 09/30	
2-Chloronaphthalene 2-Nitroaniline	15.0 ប	mg/Kg			09/06 09/30 09/06 09/30	
Dimethylphthalate	15.0 ປ	mg/Kg			09/06 09/30	HTT
Acenaphthylene	15.0 U	mg/Kg			09/06 09/30	MTT MTT
2,6-Dinitrotoluene	15.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT
3-Nitroaniline	15.0 U	mg/Kg			09/06 09/30	HTT
Acenaphthene	15.0 U	mg/Kg			09/06 09/30	HTT
2,4-Dinitrophenol	15.0 ປ 15.0 ປ	mg/Kg			09/06 09/30	MTT
4-Nitrophenol	15.0 U 15.0 U	mg/Kg			09/06 09/30	MTT
Dibenzofuran	15.0 U	mg/Kg			09/06 09/30	MTT
2,4-Dinitrotoluene	15.0 U	mg/Kg mg/Kg			09/06 09/30	MTT
Diethylphthalate	15.0 U	mg/Kg			09/06 09/30	MTT
4-Chlorophenyl-Phenylet	15.0 ປ	mg/Kg			09/06 09/30	MTT
Fluorene	15.0 บ	mg/Kg			09/06 09/30	MTT
4-Nitroaniline	15.0 ប	mg/Kg			09/06 09/30	MTT
4,6-Dinitro-2-Methylphe n-Nitrosodiphenylamine	15.0 U	mg/Kg	EPA 8270		09/06 09/30 09/06 09/30	MTT
4-Bromophenyl-Phenyleth	15.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT MTT
Hexachlorobenzene	15.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Pentachlorophenol	15.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Phenanthrene	15.0 ປ 15.0 ປ	mg/Kg	EPA 8270		09/06 09/30	MIT
Anthracene	15.0 ປ 15.0 ປ	mg/Kg	EPA 8270		09/06 09/30	MTT
di-n-Butylphthalate	15.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Fluoranthene	15.0 U	mg/Kg mg/Kg	EPA 8270		09/06 09/30	MTT
Pyrene	15.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Butylbenzylphthalate	15.0 U	mg/Kg	EPA 8270 EPA 8270		09/06 09/30	MTT
3,3-Dichlorobenzidine	15.0 ປ	mg/Kg	EPA 8270		09/06 09/30	MTT
Benzo(a)Anthracene Chrysene	15.0 U	mg/Kg	EPA 8270		09/06 09/30	MIT
bis(2-Ethylhexyl)Phthal	15.0 ປ	mg/Kg	EPA 8270		09/06 09/30 09/06 09/30	MTT
di-n-Octylphthalate	1 5.0 U	mg/Kg	EPA 8270		09/06 09/30	MT T MT T
Benzo(b)Fluoranthene	15.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Benzo(k)Fluoranthene	15.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Benzo(a)Pyrene	15.0 ປ 15.0 ປ	mg/Kg	EPA 8270		09/06 09/30	MTT
Indeno(1,2,3-cd)Pyrene	15.0 U 15.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT
ulbenz(a,h)Anthracene	15.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Benzo(g,h,i)Perylene	15.0 U	mg/Kg mg/Kg	EPA 8270		09/06 09/30	MTT
Sammia Barana		g/ 1/g	EPA 8270		09/06 09/30	MTT
Sample Preparation			EPA 3050 Digest			
Total Metals Analysis ICP Screen, ICF			_			
Aluminum			EPA	n/a		
Antimony	9700	mg/Kg	EPA 6010	, 🕳	08/31 09/02	D L.G
Arsenic	114 U	mg/Kg	EPA 6010		08/31 09/02	DLG DLG
Barium	114 U 170	mg/Kg	EPA 6010		08/31 09/02	DLG
Beryllium		mg/Kg	EPA 6010		08/31 09/02	DLG
Cadmium	5.7 บ 5.7 บ	mg/Kg	EPA 6010		08/31 09/02	DLG
Calcium	2200	mg/Kg	EPA 6010		08/31 09/02	DLG
Chromium	16	mg/Kg mg/Kg	EPA 6010 EPA 6010		08/31 09/02	DLG
7		3/ 1/3	ELW OUTO		08/31 09/02	DLG
-						



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4327-8

Client Sample ID :LAY-BKGD-S03 POINT LAY

Matrix

:SOIL

ANCHORAGE, AK 99518 TEL: (907) 562-2343

FAX: (907) 561-5301

5633 8 STREET

Client Name

:ICF KAISER ENGINEERING

Ordered By Project Name :RAY MORRIS :DEW LINE RI/FS :41096-412-01

Project# PWSID

:UA

WORK Order

Received

:70058

Report Completed :10/08/93 Collected

:08/23/93

@ 16:20 hrs :08/25/93 @ 12:00 hrs

Technical Director: STEPHEN C. EDE_ Released By : Stephen C. EDE_

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN. THE HIGH

DETECTION LIMIT FOR 8270 IS DUE TO THE FACT THAT THE SAMPLE FORMED A THICK SLUDGE WHEN CONCENTRATED DOWN TO 1.0 ML, IT NEEDED TO BE

DILUTED.

Senzene	Parameter	QC Re su lts Qua		Method	Allowable Limits	Ext. Date	Anal Date	In it
## Bromobenzene				EPA 8260				
Bromochloromethane	· · · · · = = · · · ·	0.040 U	mg/Kg			08/26	09/05	MCM
Bromodichloromethane 0.040 U mg/Kg		0.040 U						
## Bromoform	Bromochioromethane	0.040 ប						
Bromomethane		0.040 U						
Bromomethane		0.040 U						
N=Buty Denzene		0.040 U						T T
sec-Butylbenzene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM tert-Butylbenzne 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM Carbon Tetrachloride 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM Chlorobenzene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM Chlorotothane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM Chlorotoluene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 2-Chlorotoluene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 4-Chlorotoluene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 12Dibromo3Chloropropane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,2-Dibromoethane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,2-Dichlorobenzene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,2-Dichlorobenzene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,3-Dichlorobenzene 0.040 U mg/Kg EPA 8260 <td></td> <td>0.040 U</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>110 M</td>		0.040 U						110 M
Carbon Tetrachloride 0.040 U mg/kg EPA 8260 08/26 09/05 McM Carbon Tetrachloride 0.040 U mg/kg EPA 8260 08/26 09/05 McM Chlorobenzene 0.040 U mg/kg EPA 8260 08/26 09/05 McM Chloroform 0.040 U mg/kg EPA 8260 08/26 09/05 McM Chloromethane 0.040 U mg/kg EPA 8260 08/26 09/05 McM Chlorotoluene 0.040 U mg/kg EPA 8260 08/26 09/05 McM 2-Chlorotoluene 0.040 U mg/kg EPA 8260 08/26 09/05 McM 4-Chlorotoluene 0.040 U mg/kg EPA 8260 08/26 09/05 McM 4-Chlorotoluene 0.040 U mg/kg EPA 8260 08/26 09/05 McM 12Dibromochloromethane 0.040 U mg/kg EPA 8260 08/26 09/05 McM 1,2-Dibromoethane 0.040 U mg/kg EPA 8260 08/26 09/05 McM 1,2-Dichlorobenzene 0.040 U mg/kg EPA 8260 08/26 09/05 McM 1,3-Dichlorobenzene 0.040 U mg/kg EPA 8260	sec-Butylbenzene							
Carbon Tetrachloride Chlorobenzene Chloroben	tert-Butylbenzne							_
Chloroethane	Carbon Tetrachloride							
Chloroethane								
Chloroform Chloromethane Chloromethane C-Chloromethane C-Chlorotoluene C-Chlorodolloene C-Chlorotoluene C-Chlorotoluene C-Chlorotoluene C-Chloromethane C-Chloromethane C-Chloromethane C-Chloromethane C-Chlorotoluene C-Chlorotoluene C-Chloromethane C-Chlorotoluene C-Chlorotoluene C-Chlorotoluene C-Chlorotoluene C-Chloromethane C-Chlorotoluene C-Chlo								
Chloromethane 2-Chlorotoluene 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 4-Chlorotoluene 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 4-Chlorotoluene 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 32Dibromochloromethane 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 32Dibromosthane 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 32Dibromoethane 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 31,2-Dibromoethane 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 31,2-Dichlorobenzene 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 31,2-Dichlorobenzene 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 31,3-Dichlorobenzene 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 31,4-Dichlorobenzene 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 31,1-Dichloroethane 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 31,1-Dichloroethane 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 31,2-Dichloroethene 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 31,1-Dichloroethene 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 31,1-Dichloroethene 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 31,1-Dichloroethene 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 31,1-Dichloroethene 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 31,2-Dichloroethene 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 31,2-Dichloropropane 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 31,3-Dichloropropane 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 31,3-Dichloropropane 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 31,3-Dichloropropane 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 31,3-Dichloropropane 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 31,3-Dichloropropane 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 31,3-Dichloropropane 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 31,3-Dichloropropane 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 31,1-Dichloropropane 30.040 U mg/Kg EPA 8260 38/26 09/05 MCM 31,1-Dichloropropane 30.040 U mg/Kg EPA 8260 30.040 U mg/Kg EPA 8260 30.040 08/26 09/05 MCM								
2-Chlorotoluene								
## Chlorotoluene								
Dibromochloromethane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,2-Dibromoethane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 0.040 U mg/Kg EPA								
12Dibromo3Chloropropane	Dibromochloromethane							
1,2-Dibromoethane	12Dibromo3Chloropropane							
Dibromomethane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,2-Dichlorobenzene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,3-Dichlorobenzene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,4-Dichlorobenzene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM Dichlorodifluoromethane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 0.1,1-Dichloroethane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,2-Dichloroethane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 0.1,1-Dichloroethene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 0.1,1-Dichloroethene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 0.1,1-Dichloroethene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 0.1,2-Dichloroethene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 0.1,2-Dichloroethene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 0.1,2-Dichloropropane 0.040 U mg/Kg EPA 8260 08/26 09	1,2-Dibromoethane							
1,2-Dichlorobenzene	Dibromomethane	_						
1,3-Dichlorobenzene	1,2-Dichlorobenzene							
1,4-Dichlorobenzene	1,3-Dichlorobenzene		_					
Dichlorodifluoromethane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,1-Dichloroethane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,2-Dichloroethane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,1-Dichloroethene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM cis-1,2-Dichloroethene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM trans1,2-Dichloroethene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,2-Dichloropropane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,3-Dichloropropane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 2,2-Dichloropropane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,1-Dichloropropane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,1-Dichloropropane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,1-Dichloropropane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM	1,4-Dichlorobenzene							
1,1-Dichloroethane	Dichlorodifluoromethane	_						
1,2-Dichloroethane	1,1-Dichloroethane							
1,1-Dichloroethene	1,2-Dichloroethane							
cis-1,2-Dichloroethene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM trans1,2-Dichloroethene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,2-Dichloropropane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,3-Dichloropropane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 2,2-Dichloropropane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,1-Dichloropropane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,1-Dichloropropene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM Ethylbergene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM								
trans1,2-Dichloroethene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,2-Dichloropropane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,3-Dichloropropane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 2,2-Dichloropropane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,1-Dichloropropene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM Ethylbergene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM	Cis-1.2-Dichloroethene							
1,2-Dichloropropane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,3-Dichloropropane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 2,2-Dichloropropane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,1-Dichloropropene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM Ethylbergene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM	trans1.2-Dichloroethene							
1,3-Dichloropropane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 2,2-Dichloropropane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,1-Dichloropropene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM Ethylbenzene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM	1.2-Dichloropropage							
2,2-Dichloropropane 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM 1,1-Dichloropropene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM Ethylberzene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM	1,3-Dichloropropane							_
1,1-Dichloropropene 0.040 U mg/Kg EPA 8260 08/26 09/05 MCM	2,2-Dichloropropane							
Ethvihenzene 00/26 09/05 mm	1.1-Dichloropropene							
0.040 U mg/kg EPA 8260 08/26 09/05	Ethylbenzene							MCM
		U.U4U U	mg/kg	EPA 8260		08/26	09/05	





COMMERCIAL TESTING & ENGINEERING CO. ENVIRONMENTAL LABORATORY SERVICES

5 NGE 1908						
Chemlab Ref.# :93.4327-8	RE	PORT of	ANALYSIS XX	•		
Client Sample ID :LAY-BKGD-SO			_		56 33 B ANCHORAGE, A	STREET
Matrix :SOIL	3 FOINT L	.AY		•	TEL: (907) 5	562-2343
.501L					FAX: (907) 5	
2,4,6-Trichlorophenol	12.0					
2,4,5-Trichlorophenol	12.0 U	3/ 3			09/06 09/30	MT
2-Chioronaphthalene		3/ ••3			09/06 09/30	HT
2-Nitroaniline		3/ • • 3	EPA 8270		09/06 09/30	MT
Dimethylphthalate		37 **3	EPA 8270		09/06 09/30	MTT
Acenaphthylene		3/ ••3	EPA 8270		09/06 09/30	MTT
2,6-Dinitrotoluene	12.0 U 12.0 U	3/ •• 9	EPA 8270		09/06 09/30	MTT
3-Nitroaniline	12.0 U		EPA 8270		09/06 09/30	MTI
Acenaphthene	12.0 U		EPA 8270		09/06 09/30	MTT
2,4-Dinitrophenol	12.0 U	3/ • • 3	EPA 8270		09/06 09/30	MTT
4-Nitrophenol	12.0 U	3/ •••	EPA 8270		09/06 09/30	MTT
Dibenzofuran	12.0 U	3/ •• 3	EPA 8270		09/06 09/30	MTT
2,4-Dinitrotoluene	12.0 U		EPA 8270		09/06 09/30	MTT
Diethylphthalate	12.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT
4-Chlorophenyl-Phenylet	12.0 U	mg/Kg	EPA 8270		09/06 09/30	HTT.
truorene	12.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT
4-Nitroaniline	12.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT
4,6-Dinitro-2-Methylphe	12.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT
n-Nitrosodiphenylamine	12.0 U	ng/Kg	EPA 8270		09/06 09/30	MTT
4-Bromophenyl-Phenyleth	12.0 U	mg/Kg mg/Kg	EPA 8270		09/06 09/30	MTT
Hexachlorobenzene	12.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Pentachlorophenol	12.0 U	mg/Kg	EPA 8270 EPA 8270		09/06 09/30	MTT
Phenanthrene	12.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Anthracene	12.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT
di-n-Butylphthalate	12.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Fluoranthene	12.0 ប៊	mg/Kg	EPA 8270		09/06 09/30	MTT
Pyrene	12.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Butylbenzylphthalate	12.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT
3,3-Dichlorobenzidine	12.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Benzo(a)Anthracene Chrysene	12.0 U	mg/Kg	EPA 8270		09/06 09/30 09/06 09/30	MTT
his (2-Ethylham) \Pht.	12.0 ប	mg/Kg	EPA 8270		09/06 09/30	MTT
bis(2-Ethylhexyl)Phthal di-n-Octylphthalate	12.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT MTT
Benzo(b)Fluoranthene	12.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Benzo(k)Fluoranthene	12.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Benzo(a)Pyrene	12.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Indeno(1,2,3-cd)Pyrene	12.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Dibenz(a,h)Anthracene	12.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Benzo(g,h,i)Perylene	12.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT
(3) THE CLYTCHE	12.0 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Sample Preparation						
Total Metals Analysis			EPA 3050 Digest			
ICP Screen. ICF			-			
Aluminum	17000	mm ///	EPA	n/a		
Antimony	79 U	mg/Kg	EPA 6010		08/31 09/02	DLG
Arsenic	79 U	mg/Kg	EPA 6010		08/31 09/02	DLG
Barium	260	mg/Kg	EPA 6010		08/31 09/02	DLG
Beryllium	4.0 U	mg/Kg	EPA 6010		08/31 09/02	DLG
Cadmium	4.0 U	mg/Kg mg/Kg	EPA 6010		08/31 09/02	DLG
Calcium	3000	mg/Kg	EPA 6010		08/31 09/02	DLG
Chromium	28	mg/Kg	EPA 6010		08/31 09/02	DLG
	- -	3, 1,7	EPA 6010		08/31 09/02	DLG



ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.#

:93.4327-9

REPORT of ANALYSIS

5633 8 STREET ANCHORAGE, AK 99518

Matrix

Client Sample ID :LAY-BKGD-S04 POINT LAY

TEL: (907) 562-2343 FAX: (907) 561-5301

:SOIL

:ICF KAISER ENGINEERING

Client Name Ordered By Project Name

:RAY MORRIS :DEW LINE RI/FS

Project# PWSID

:41096-412-01 :UA

WORK Order Report Completed :10/08/93

:70058

Collected

:08/23/93 @ 16:00 hrs.

Received

@ 12:00 hrs. :08/25/93

Technical Director: STEPHEN C. EDE Released By :

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN. THE HIGH

DETECTION LIMIT FOR 8270 IS DUE TO THE FACT THAT THE SAMPLE FORMED A THICK SLUDGE WHEN CONCENTRATED DOWN TO 1.0 ML, IT NEEDED TO BE

DILUTED.

Senzene
0.030 U mg/Kg EPA 8260 08/26 09/05 M





ENVIRONMENTAL LABORATORY SERVICES

S-NCE 1908						
Chemlab Ref.# :93.4327-9	RE	PORT of	ANALYSIS SKA		5633 B	STREET
Chemiab Ref.# :93.4327-9 Client Sample ID :LAY-BKGD-SC					ANCHORAGE, A	K 99518
Matrix :SOIL	04 POINT L	.AY			TEL: (907) ! FAX: (907) !	562-2343 561-5301
-					(55.)	301-3301
2,4,6-Trichlorophenol	6.90 ປ	mg/Kg	EPA 8270			
2,4,5-Trichlorophenol	6.90 U	2/ 113	EPA 8270		09/06 09/30	
2-Chloronaphthalene 2-Nitroaniline	6.90 U		EPA 8270		09/06 09/30	
Dimethylphthalate	6.90 บ		EPA 8270		09/06 09/30 09/06 09/30	
Acenaphthylene	6.90 U	3/ *19	EPA 8270		09/06 09/30	MTT MTT
2,6-Dinitrotoluene	6.90 U	3/ */9	EPA 8270		09/06 09/30	MTT
3-Nitroaniline	6.90 U	37 • • • 9	EPA 8270		09/06 09/30	MTT
Acenaphthene	6.90 ប 6.90 ប	3/ •/9	EPA 8270		09/06 09/30	MTT
2,4-Dinitrophenol	6.90 U 6.90 U	3/ 1/9	EPA 8270		09/06 09/30	MIT
4-Nitrophenoi	6.90 U	5/ 1/9	EPA 8270		09/06 09/30	MTT
Dibenzofuran	6.90 U	3/ • • 9	EPA 8270		09/06 09/30	MTT
2,4-Dinitrotoluene	6.90 U	mg/Kg	EPA 8270 EPA 8270		09/06 09/30	MTT
Diethylphthalate	6.90 ป		EPA 8270		09/06 09/30	MTT
4-Chlorophenyi-Phenylet Fluorene	6.90 U	mg/Kg	EPA 8270		09/06 09/30 09/06 09/30	HTT
4-Nitroaniline	6.90 U	mg/Kg	EPA 8270		09/06 09/30	MTT MTT
4,6-Dinitro-2-Methylphe	6.90 U	mg/Kg	EPA 8270		09/06 09/30	MTT
N-Nitrosodiphenvlamine	6.90 U	mg/Kg	EPA 8270		09/06 09/30	MTT
4-Bromophenyl-Phenyleth	6.90 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Hexachlorobenzene	6.90 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Pentachlorophenol	6.90 U	mg/Kg mg/Kg	EPA 8270		09/06 09/30	MTT
Phenanthrene	6.90 U	mg/Kg	EPA 8270 EPA 8270		09/06 09/30	MTT
Anthracene	6.90 U	mg/Kg	EPA 8270		09/06 09/30	MTT
di-n-Butylphthalate Fluoranthene	6.90 บ	mg/Kg	EPA 8270		09/06 09/30	HTT
Pyrene	6.90 U	mg/Kg	EPA 8270		09/06 09/30 09/06 09/30	MTT
Butylbenzylphthalate	6.90 U	m g/K g	EPA 8270		09/06 09/30	MTT HTT
3,3-Dichlorobenzidine	6.90 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Benzo(a)Anthracene	6.90 U 6.90 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Chrysene	6.90 U 6.90 U	mg/Kg	EPA 8270		09/06 09/30	MTT
bis(2-Ethylhexyl)Phthal	6.90 U	mg/Kg mg/Kg	EPA 8270		09/06 09/30	MTT
di-n-Octylphthalate	6.90 บ	mg/Kg	EPA 8270 EPA 8270		09/06 09/30	MTT
Benzo(b)Fluoranthene	6.90 U	mg/Kg	EPA 8270		09/06 09/30	HTT
Benzo(k)Fluoranthene Benzo(a)Pyrene	6 .90 U	mg/Kg	EPA 8270		09/06 09/30 09/06 09/30	HTT
Indeno(1,2,3-cd)Pyrene	6.90 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Dibenz(a,h)Anthracene	6.90 U	m g/K g	EPA 8270		09/06 09/30	M TT M TT
Benzo(g,h,i)Perylene	6.90 U	mg/Kg	EPA 8270		09/06 09/30	MTT
	6.90 U	mg/Kg	EPA 8270		09/06 09/30	MTT
Sample Preparation	~		F713 3050 51			
Total Metals Analysis			EPA 3050 Digest			
ICP Screen, ICF			EPA	- /-		
Aluminum Antimony	19000	mg/Kg	EPA 6010	n/a	00/21 00/02	nr -
Arsenic	6 6 U	mg/Kg	EPA 6010		08/31 09/02 08/31 09/02	DL G
Barium	6 6 U	mg/Kg	EPA 6010		08/31 09/02	DLG DLG
Beryllium	290	mg/Kg	EPA 6010		08/31 09/02	DLG
Cadmium	4.2 3.3 U	mg/Kg	EPA 6010		08/31 09/02	DLG
Calcium	3.3 U 1800	mg/Kg	EPA 6010		08/31 09/02	DLG
Chromium	31	m g/K g m g/K g	EPA 6010		08/31 09/02	DLG
		™∂\ vā	EPA 6010		08/31 09/02	DLG





REPORT of ANALYSIS

ENVIRONMENTAL LABORATORY SERVICES



Chemlab Ref. = :93.4327-5

Client Sample ID :LAY-BKGD-SD01 POINT LAY

Matrix

:SOIL

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

Client Name Ordered By

:ICF KAISER ENGINEERING :RAY MORRIS

Project Name Project#

:DEW LINE RI/FS :41096-412-01

PWSID

:UA

WORK Order

:70058

Report Completed :10/08/93

Collected

:08/23/93

9 14:15 hr: :08/25/93 @ 12:00 hr:

Received Technical Director: STEPHEN C. EDE
Released By : John Call

Sample Remarks: SAMPLE COLLECTED BY: A. FOLOUSKY AND S.S. SEPPOVEN. THE HIGH DETECTION LIMIT FOR 8270 IS DUE TO THE FACT THAT THE SAMPLE FORMED A THICK SLUDGE WHEN CONCENTRATED DOWN TO 1.0 ML, IT NEEDED TO BE DILUTED.

Parameter	QC Results Qual Units	Method	Allowable Limits		Anal Date	Init
Volatile Organics Benzene Bromobenzene Bromochloromethane Bromoform Bromomethane n-Butylbenzene sec-Butylbenzene tert-Butylbenzene Carbon Tetrachloride Chlorobenzene Chlorotoluene Chlorotoluene 2-Chlorotoluene Dibromochloromethane 1,2-Dibromoethane 1,2-Dichlorobenzene 1,4-Dichlorobenzene 1,1-Dichloroethane 1,1-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethane 1,1-Dichloropropane 1,2-Dichloropropane 1,3-Dichloropropane 1,1-Dichloropropane 1,1-Dichloropropane Ethylbenzene	0.050 U mg/kg 0.050 U mg/kg	EPA 8260 EPA 8260		08/26 0 08/26	09/05 09/05	



ENVIRONMENTAL LABORATORY SERVICES

	BOHATO	RY SERVICES			-	
SINCE 1908				·		
Chemlab Ref.# :93.4327-5	F	REPORT of ANAI	LYSIS LE		7000 D D	
Client Sample ID (124 pure			1		5633 B S ANCHORAGE, AK	TREET
Client Sample ID :LAY-BKGD-SD01 Matrix :SOII	POINT	I LAY 3			TEL: (907) 56	52-2343
Matrix :SOIL		CENTRAL TO			FAX: (907) 56	31-5301
2.46 m		(Shu				
2,4,6-Trichlorophenol	13.0	U mg/Kg	EPA 8270		09/06 09/30	Multi-
2,4,5-Trichlorophenol	13.0	U mg/Kg	EPA 8270			MTT
2-Chloronaphthalene		U mg/Kg	EPA 8270		09/06 09/30	HTT
2-Nitroaniline		U mg/Kg	EPA 8270		09/06 09/30	HTT
Dimethylphthalate		- J, J			09/06 09/30	MTT
Acenaphthylene		3,	EPA 8270		09/06 09/30	MTT
2,6-Dinitrotoluene		575	EPA 8270		09/06 09/30	MTT
3-Nitroaniline		U mg/Kg	EPA 8270		09/06 09/30	MTT
Acenaphthene		U mg/Kg	EPA 8270		09/06 09/30	MTT
2,4-Dinitrophenol		U mg/Kg	EPA 8270		09/06 09/30	MTT
4-Nitrophenol		U mg/Kg	EPA 8270		09/06 09/30	MTT
Dibenzofuran		U mg/Kg	EPA 8270		09/06 09/30	MTT
Dibenzoruran		U mg/Kg	EPA 8270		09/06 09/30	MTT
2,4-Dinitrotoluene	13.0	U mg/Kg	EPA 8270		09/06 09/30	MTT
Diethylphthalate	13.0	U mg/Kg	EPA 8270		09/06 09/30	
4-Chlorophenyl-Phenylet		U mg/Kg	EPA 8270			MTT
Fluorene		U mg/Kg	EPA 8270		09/06 09/30	MTT
4-Nitroaniline		U mg/Kg	EPA 8270		09/06 09/30	MTT
4,6-Dinitro-2-Methylphe		U mg/Kg	EPA 8270		09/06 09/30	MTT
n-Nitrosodiphenylamine		5/ •• 5			09/06 09/30	MTT
4-Bromophenyl-Phenyleth		٠ ٠ ي	EPA 8270		09/06 09/30	MTT
Hexachlorobenzene		3,	EPA 8270		09/06 09/30	MTT
Pentachlorophenol			EPA 8270		09/06 09/30	MTT
Phenanthrene		3/ ***	EPA 8270		09/06 09/30	MTT
Anthracene		U mg/Kg	EPA 8270		09/06 09/30	MTT
di-n-Butylphthalate		U mg/Kg	EPA 8270		09/06 09/30	MTT
Fluoranthene		U mg/Kg	EPA 8270		09/06 09/30	MTT
Pyrene	-	U mg/Kg	EPA 8270		09/06 09/30	HTT
		U mg/Kg	EPA 8270		09/06 09/30	HTT
Butylbenzylphthalate		U mg/Kg	EPA 8270		09/06 09/30	HTT
3,3-Dichlorobenzidine		U mg/Kg	EPA 8270		09/06 09/30	MTT
Benzo(a)Anthracene	13.0	U mg/Kg	EPA 8270		09/06 09/30	MTT
Chrysene	13.0	U mg/Kg	EPA 8270		09/06 09/30	
bis(2-Ethylhexyl)Phthal		U mg/Kg	EPA 8270			MTT
di-n-Octylphthalate		U mg/Kg	EPA 8270		09/06 09/30	MTT
Benzo(b)Fluoranthene		U mg/Kg	EPA 8270		09/06 09/30	MTT
Benzo(k)Fluoranthene	13.0				09/06 09/30	HTT
Dane - (- \ D	13.0		EPA 8270		09/06 09/30	MTT
T-d/1 0 0 10 0	13.0 t		EPA 8270		09/06 09/30	MTT
Dib/ 1		27 4.5	EPA 8270		09/06 09/30	MTT
D			EPA 8270		09/06 09/30	MTT
	13.0 (J mg/Kg	EPA 8270		09/06 09/30	MTT
Sample Preparation						
Total Metals Analysis		E	PA 3050 Digest			
ICP Screen, ICF			-			
• • • • • • • • • • • • • • • • • • • •	225		EPA	n/a		
	9000	mg/Kg	EPA 6010		08/31 09/02	DLG
Antimony	85 t	J J mg/Kg J. 2	EPA 6010		08/31 09/02	DLG
Arsenic	85 t	J mg/Kg	EPA 6010		08/31 09/02	DLG
Barium	340	mg/Kg	EPA 6010		08/31 09/02	DLG
Beryllium	4.3 t		EPA 6010		08/31 09/02	DLG
Cadmium	4.3 t		EPA 6010		08/31 09/02	
Calcium	2000	mg/Kg	EPA 6010		08/31 09/02	DLG
Chromium	33	mg/Kg	EPA 6010			DLG
			~ v 0010		08/31 09/02	DLG



ENVIRONMENTAL LABORATORY SERVICES

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S NIE 1908		REPORT of ANALY	cro Des	
Chemlab Ref.# Client Sample ID Matrix	:93.4327-5 :LAY-BKGD-SD01 POIN :SOIL	TIANA TO TANALI	515 XX C	5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301
Cobalt Copper Iron Lead Magnesium Manganese Molybdenum Nickel Potassium Selenium Silver Sodium Thallium Vanadium	8.6 25 33000 17 3800 100 4.3 27 1200 85 43 174 0.40	U mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg U R mg/Kg U R mg/Kg U R mg/Kg U R mg/Kg	EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010	08/31 09/02 DLC 08/31 09/02 DLC 08/31 09/02 DLC 08/31 09/02 DLC 08/31 09/02 DLC 08/31 09/02 DLC 08/31 09/02 DLC 08/31 09/02 DLC 08/31 09/02 DLC 08/31 09/02 DLC 08/31 09/06 DLC 08/31 09/02 DLC 08/31 09/02 DLC 08/31 09/02 DLC 08/31 09/02 DLC 08/31 09/02 DLC 08/31 09/02 DLC 08/31 09/02 DLC
Zinc TOC, Soil	48 68100	mg/Kg mg/Kg P	EPA 6010 SEP Ref Lab	08/31 09/02 DLG

All changes 12/2/94

See Special Instructions Above ** See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit. D = Secondary dilution.

UA = Unavailable

NA = Not AnalyzedLT = Less Than

GT = Greater Than





ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4328-5 Client Sample ID :LAY-BKGD-SW01 POINT LAY

Matrix

:WATER

ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

5633 B STREET

Client Name

Ordered By

: ICF KAISER ENGINEERING

Project Name Project#

:RAY MORRIS :DEW LINE RI/FS :41096-412-01

PWSID

WORK Order

Received

:70060

Report Completed :09/20/93 Collected

:08/23/93 @ 13:15 hr :08/25/93 @ 12:00 hr

Technical Director: STEPHEN C

Released By :

EDE.

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN.

	Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	In i t
	Volatile Organics								
	Benzene	0.0010	U	mæ / [EPA 8260				
	Bromobenzene	0.0010	Ü	mg/L mg/L	EPA 8260		09/02	09/02	KW
	Bromochloromethane	0.0010	Ü	mg/L	EPA 8260		09/02	09/02	KWI
	Bromodichloromethane	0.0010	Ü		EPA 8260			09/02	KW
	Bromoform	0.0010	Ü	mg/L mg/L	EPA 8260			09/02	KWP
	Bromomethane	0.0010	Ü	mg/L	EPA 8260		09/02		KWP
	n-Butylbenzene	0.0010	Ü	_	EPA 8260		09/02		KWE
_	sec-Butylbenzene	0.0010	บ	mg/L mg/L	EPA 8260		09/02	09/02	KWP:
	tert-Butylbenzne	0.0010	Ü	mg/L	EPA 8260		09/02	09/02	KWE
	Carbon Tetrachloride	0.0010	บ	mg/L	EPA 8260		09/02		KWM
	Chlorobenzene	0.0010	Ü	mg/L	EPA 8260		09/02		KWM
	Chloroethane	0.0010	Ü	mg/L	EPA 8260 EPA 8260		09/02	09/02	KWM
	Chloroform	0.0010	Ü	mg/L	EPA 8260		09/02		KWH
	Chloromethane	0.0010	Ü	mg/L	EPA 8260		09/02		KWH
	2-Chlorotoluene	0.0010	Ü	mg/L			09/02		KWM
	4-Chlorotoluene	0.0010	Ü	mg/L	EPA 8260		09/02		KWB
	Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/02		KWH
	12Dibromo3Chloropropane	0.0010	IJ		EPA 8260		09/02		KWM
	1,2-Dibromoethane	0.0010	Ü	mg/L mg/L	EPA 8260		09/02		KWM
	Dibromomethane	0.0010	Ü	mg/L	EPA 8260		09/02		KWH
	1,2-Dichlorobenzene	0.0010	Ü		EPA 8260		09/02	09/02	KWM
	1.3-Dichlorobenzene	0.0010	U U	mg/L mg/L	EPA 8260		09/02		KWM
	1,4-Dichlorobenzene	0.0010	Ü	mg/L	EPA 8260		09/02		KWM
	Dichlorodifluoromethane	0.0010	Ü	mg/L	EPA 8260		09/02		KWH
	1,1-Dichloroethane	0.0010	Ü	mg/L	EPA 8260		09/02		KWM
	1,2-Dichloroethane	0.0010	Ü	mg/L	EPA 8260 EPA 8260		09/02		KWM
	1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02		KWM
	cis-1,2-Dichloroethene	0.0010	IJ	mg/L	EPA 8260		09/02		KWM
	trans1,2-Dichloroethene	0.0010	Ü	mg/L	EPA 8260		09/02		KWM
	1,2-Dichloropropane	0.0010	Ü	mg/L	EPA 8260		09/02		KWM
	1,3-Dichloropropane	0.0010	Ü	mg/L	EPA 8260		09/02		KWM
	2,2-Dichloropropane	0.0010	บั	mg/L			09/02		KWM
	1.1-Dichloropropene	0.0010	Ü	mg/L	EPA 8260 EPA 8260		09/02		KWM
	Ethylbenzene	0.0010	Ü	mg/L	EPA 8260		09/02		KWM
	Hexachlorobutadiene	0.0010	Ü	mg/L	EPA 8260		09/02		KWM
_	Isopropylbenzene	0.0010	Ü	mg/L	EPA 8260		09/02		KWM
	p-Isopropyltoluene	0.0010	Ü	mg/L	EPA 8260		09/02		KWM
			•		EFN 0200		09/02	09/02	KWH



COMMERCIAL TESTING & ENGINEERING CO. ENVIRONMENTAL LABORATORY SERVICES

risas inde	REPO	ORT of ANALY	ISIS XX		5633 B ST	REET
Chemlab Ref.# :93.4328-5		~ 1 - 1-3	·		ANCHORAGE, AK	99518
Client Sample ID :LAY-BKGD-S	W01 POINT L	致 3)			TEL: (907) 562 FAX: (907) 561	
Matrix :WATER	WO1 POINT L	Commerce				
		<u> </u>				
Methylene Chloride	0.0010 U	mg/L	EPA 8260		09/02 09/02	KWI
Napthalene	0.0010 U	mg/L	EPA 8260		09/02 09/02	KWI
n-Propylbenzene	0.0010 U	mg/L	EPA 8260		09/02 09/02	KW!
Styrene	0.0010 U	mg/L	EPA 8260		09/02 09/02	KWI
1112-Tetrachloroethane	0.0010 U	mg/L	EPA 8260		09/02 09/02	KWI
1122-Tetrachloroethane	0.0010 U	mg/L	EPA 8260		09/02 09/02	KWI
Tetrachloroethene	0.0010 U	mg/L	EPA 8260		09/02 09/02	KWI
Toluene	0.0010 U	mg/L	EPA 8260		09/02 09/02	KWI
1,2,3-Trichlorobenzene	0.0010 U	mg/L	EPA 8260		09/02 09/02	KWI
1,2,4-Trichlorobenzene	0.0010 U	mg/L	EPA 8260		09/02 09/02	KWI
1,1,1-Trichloroethane	0.0010 U	mg/L	EPA 8260		09/02 09/02	KMI
1,1,2-Trichloroethane	0.0010 U	mg/L	EPA 8260		09/02 09/02	KWI
Trichloroethene	0.0010 U	.mg/L	EPA 8260		09/02 09/02	KWI
Trichlorofluoromethane	0.0010 U	mg/L	EPA 8260		09/02 09/02	KWI
1,2,3-Trichloropropane	0.0010 U	mg/L	EPA 8260		09/02 09/02	KWF
1,2,4-Trimethylbenzene	0.0010 U	mg/L	EPA 8260		09/02 09/02	KWI
1,3,5-Trimethylbenzene	0.0010 U	mg/L	EPA 8260		09/02 09/02	KWF
Vinyl Chloride	0.0010 U	mg/L	EPA 8260		09/02 09/02	KWI
p+m-Xylene	0.0010 U	mg/L	EPA 8260		09/02 09/02	KWP
o-Xylene	0.0010 U	mg/L	EPA 8260		09/02 09/02	KWF
Total Metals Analysis			-	_		
ICP Screen, ICF			EPA	n/a	20 (20 20 (2)	
Aluminum	0.35	mg/L	EPA 6010		09/02 09/06	pro
Antimony	0.10 U	mg/L	EPA 6010		09/02 09/06	El
Arsenic	0.10 U	mg/L	EPA 6010		09/02 09/06	,
Barium	0.051	mg/L	EPA 6010		09/02 09/06	DLG
Beryllium	0.050 U	mg/L	EPA 6010		09/02 09/06	DFC
Cadmium	0.050 U	mg/L	EPA 6010		09/02 09/06	DLG DLG
Calcium	5.5	mg/L	EPA 6010		09/02 09/06	DLG
Chromium	0.050 U	mg/L	EPA 6010		09/02 09/06 09/02 09/06	DLG
Cobalt	0.10 U	mg/L	EPA 6010		09/02 09/06	DLG
Copper	0.050 U	mg/L	EPA 6010		09/02 09/06	DLG
Iron	2.0	mg/L	EPA 6010		09/02 09/06	DLG
Lead	0.10 U	mg/L	EPA 6010		09/02 09/06	DLG
Magnesium	5.0 N ^c		EPA 6010		09/02 09/06	DLG
Manganese	0.12	mg/L	EPA 6010		09/02 09/06	DLG
Molybdenum	0.050 U	mg/L	EPA 6010		09/02 09/06	DLG
Nickel	0.050 U	mg/L	EPA 6010		09/02 09/06	DLG
Potassium	5.0 บ	mg/L	EPA 6010		09/02 09/06	DLG
Selenium	0.10 U	r mg/L	EPA 6010		09/02 09/06	DLG
Silver	0.050 U		EPA 6010		09/15 09/17	DFL
Sodium	17	mg/L	EPA 6010		09/02 09/03	KAW
Thallium	0.0050 U	mg/L	EPA 7841		09/02 09/06	DLG
Vanadium	0.050 U	mg/L	EPA 6010		09/15 09/17	DEL
Zinc	0.050 U	mg/L	EPA 6010		03, 13 03, 11	J. 2
Dissolved Metals Analys			_ 	n/a		
ICP Screen, ICF	0.24	M	EPA	11/ 01	09/02 09/06	_ DLG
Aluminum	0.34	mg/L	EPA 6010 EPA 6010		09/02 09/06	DLG
Antimony	0.10 U	mg/L		*	03/02 03/00	
			11	charel		

All chargs 3.4 2/2/94





ENVIRONMENTAL LABORATORY SERVICES

5 N.J.E. 104		REPOR	T of ANAI	LYSIS SEC		5500 0 07	
Chemlab Ref.#	:93.4328-5					5633 B ST HORAGE, AK	
Client Sample ID	:LAY-BKGD-SW01 POI	NT LAY	(comest	1		TEL: (907) 562	2-2343
Matrix	:WATER	5	. M			FAX: (907) 561	1-5301
		Jum of	्रें				
Arsenic	- 0.10	บ	ng/L	EPA 6010	0 09/02	09/06	DL
Barium	0.050		mg/L	EPA 6010		09/06	DL
Beryllium	0.050		mg/L	EPA 6010		09/06	DL
Cadmium	0.050		mg/L	EPA 6010		09/06	DL
Calcium	5.3		mg/L	EPA 6010		09/06	DL:
Chromium	0.050	U	mg/L	EPA 6010		09/06	DL
Cobalt	0.10	Ū	mg/L	EPA 6010		09/06	DL
Copper	0.050		mg/L	EPA 6010		09/06	DL
Iron	1.6		mg/L	EPA 6010		09/06	DL
Lead	0.10		mg/L	EPA 601		09/06	DL
Magnesium	4.9		mg/L	EPA 6010		09/06	DL
Manganese	0.12		mg/L	EPA 601		09/06	DL.
Molybdenum	0.050	U	mg/L	EPA 6010		2 09/06	DL
Nickel	0.050	Ü	mg/L	EPA 6010		2 09/06	DL(
Potassium	5.0	U	mg/L	EPA 601		2 09/06	DL
Selenium	0.10	Ü	mg/L	EPA 601		2 09/06	DL (
Silver	0.050	υJ	mg/L J.			2 09/06	DLi
Sodium	17		mg/L	EPA 601	0 09/15	5 09/17	DET
Thallium	0.0050	Ü	mg/L	EPA 784	1 09/03	2 09/03	KA!
Vanadium	0.050	Ü	mg/L	EPA 601	0 09/03	2 09/06	$\mathbf{DL}($
Zinc	0.050	U	mg/L	EPA 601	0 09/1	09/17	DFI
TOC, Nonpurgabl	.e			EPA 906	0 n/a		
TOC Range	38.6-41.2		mg/L	EPA 906		09/07	CMI
TOC Concentr			mg/L	EPA 906		09/07	CM

MI charges

See Special Instructions Above

See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed

LT = Less Than

GT = Greater Than



SGS Member of the SGS Group (Société Générale de Surveillance)



REPORT of ANALYSIS

ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.#

:93.4329-1

Client Sample ID :LAY-BKGD-SW01 POINT LAY

Matrix

:WATER

5633 B STREE ANCHORAGE, AK 9951 TEL: (907) 562-234: FAX: (907) 561-530

Client Name

:ICF KAISER ENGINEERING

Ordered By

:RAY MORRIS

Project Name Project#

:DEW LINE RI/FS :41096-412-01

PWSID

:UA

WORK Order

:70056

Report Completed :09/13/93

0 13:15 hr

Collected Received

:08/23/93

:08/25/93 @ 12:00 h:

Technical Director: STEPHEN C, EDE Released By : _

Sample Remarks: SAMPLE COLLECTED BY: S.S. SEPPOVEN.

Parameter	Results C	QC QC	Units	Method	Allowable Limits	Ext. Date	Anal Date	Ini
Semivolatile Organics				EPA 8270				
Phenol	0.031	U	mg/L	EPA 8270		08/29	08/30	149
bis(2-Chloroethyl)ether	_	Ü	mg/L	EPA 8270			08/30	MI MI
2-Chlorophenol	0.031	U	mg/L	EPA 8270			08/30	MI
1,3-Dichlorobenzene	0.031	U	ng/L	EPA 8270			08/30	III IM
1,4-Dichlorobenzene	0.031	U	mg/L	EPA 8270			08/30	HI
Benzyl Alcohol	0.031	U	mg/L	EPA 8270		08/28		HT
1,2-Dichlorobenzene	0.031	U	mg/L	EPA 8270		08/28		
2-Methylphenol	0.031	U	mg/L	EPA 8270			08/30	
bis(2-Chloroisopropyl)e	0.031	U	mg/L	EPA 8270		08/28		HT
4-Methylphenol		U	mg/L	EPA 8270		08/28		HT
n-Nitroso-di-n-Propylam		U	mg/L	EPA 8270		08/28		MT
Hexachloroethane		U	mg/L	EPA 8270		08/28		MT
Nitrobenzene		U	mg/L	EPA 8270		08/28		HT
Isophorone		U	mg/L	EPA 8270		08/28		HT
2-Nitrophenol		U	mg/L	EPA 8270		08/28		MT
2,4-Dimethylphenol		U	mg/L	EPA 8270		08/28		MT
Benzoic Acid		U	mg/L	EPA 8270		08/28		MT
bis(2-Chloroethoxy)Meth		U	mg/L	EPA 8270		08/28		MT
2,4-Dichlorophenol		U	mg/L	EPA 8270		08/28	08/30	MT
1,2,4-Trichlorobenzene		U	mg/L	EPA 8270		08/28	08/30	MT
Naphthalene		U	mg/L	EPA 8270		08/28		MI
4-Chloroaniline		U	mg/L	EPA 8270		08/28	08/30	MT
Hexachlorobutadiene		U	mg/L	EPA 8270		08/28	08/30	MT
4-Chloro-3-Methylphenol	· · · · · ·	U	mg/L	EPA 8270		08/28	08/30	MT
2-Methylnaphthalene		U	mg/L	EPA 8270		08/28	08/30	MT
Hexachlorocyclopentadie		U	mg/L	EPA 8270		08/28		MT
2,4,6-Trichlorophenol		U	mg/L	EPA 8270		08/28		HT
2,4,5-Trichlorophenol 2-Chloronaphthalene		U	mg/L	EPA 8270		08/28		MT
2-Nitroaniline		U	mg/L	EPA 8270		08/28	08/30	MT
Dimethylphthalate		U	mg/L	EPA 8270		08/28		MT
Acenaphthylene		U	mg/L	EPA 8270		08/28		MT
2,6-Dinitrotoluene		U	mg/L	EPA 8270		08/28		MT
3-Nitroaniline		U	mg/L	EPA 8270		08/28		MT
Acenaphthene		U	mg/L	EPA 8270		08/28		MT
2,4-Dinitrophenol		U	mg/L	EPA 8270		08/28		T
4-Nitrophenol		Ü	mg/L	EPA 8270		08/28		
:-HICLOPHENOI	0.031	U	mg/L	EPA 8270		08/28	08/30	MT



ENVIRONMENTAL LABORATORY SERVICES

REPORT OF ANALYSIS XX

Chemlab Ref.# :93.4329-1 Client Sample ID :LAY-BKGD-SW01 POINT LAY

Matrix :WATER

ANCHORAGE, AK 99518
TEL: (907) 562-234
FAX: (907) 561-530

				· · · · · · · · · · · · · · · · · · ·			
Dibenzofuran	0.031	บ	mg/L	EPA 8270		08/28 08/30	MI
2,4-Dinitrotoluene	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
Diethylphthalate	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
4-Chlorophenyl-Phenylet	0.031	U	mg/L	EPA 8270		08/28 08/30	TM
Fluorene	0.031	U	mg/L	EPA 8270	•	08/28 08/30	TM
4-Nitroaniline	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
4,6-Dinitro-2-Methylphe	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
n-Nitrosodiphenylamine	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
4-Bromophenyl-Phenyleth	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
Hexachlorobenzene	0.031	Ū	mg/L	EPA 8270		08/28 08/30	TM
Pentachlorophenol	0.031	Ü	mg/L	EPA 8270		08/28 08/30	ΜT
Phenanthrene	0.031	Ū	mg/L	EPA 8270		08/28 08/30	TM
Anthracene	0.031	Ū	mg/L	EPA 8270		08/28 08/30	MT
di-n-Butylphthalate	0.031	Ü	mg/L	EPA 8270		08/28 08/30	MT
Fluoranthene	0.031	Ü	mg/L	EPA 8270		08/28 08/30	MT
Pyrene	0.031	Ū	ng/L	EPA 8270		08/28 08/30	TM
Butylbenzylphthalate	0.031	บ	mg/L	EPA 8270		08/28 08/30	MT
3,3-Dichlorobenzidine	0.031	Ū	mg/L	EPA 8270(J)-D	. 1	08/28 08/30	MT
Benzo(a)Anthracene	0.031	Ū	mg/L	EPA 8270		08/28 08/30	MT
Chrysene	0.031	Ū	mg/L	EPA 8270		08/28 08/30	ТM
bis(2-Ethylhexyl)Phthal	0.031	Ū	mg/L	EPA 8270		08/28 08/30	MT
di-n-Octylphthalate	0.031	. Ü	mg/L	EPA 8270		08/28 08/30	MT
Benzo(b)Fluoranthene	0.031	Ü	mg/L	EPA 8270		08/28 08/30	MT
Benzo(k)Fluoranthene	0.031	Ū	mg/L	EPA 8270		08/28 08/30	HT
Benzo(a)Pyrene	0.031	Ŭ	mg/L	EPA 8270		08/28 08/30	MT
Indeno(1,2,3-cd)Pyrene	0.031	Ü	mg/L	EPA 8270		08/28 08/30	HT
Dibenz(a,h)Anthracene	0.031	บ	mg/L	EPA 8270		08/28 08/30	TM
Benzo(g,h,i)Perylene	0.031	U	mg/L	EPA 8270		08/28 08/30	MT
20.120 (3/, 2/. 02/20	0.031	•	mg/ L	ELA CETO		00/20 00/30	***
Residue, Non-Filterable	6		mg/L	EPA 160.2		08/30 08/31	GF
Residue, Filterable(TDS)	149		mg/L	EPA 160.1	500	09/01 09/02	RJ
,	_ ••					, , , , 	

2-4-94

See Special Instructions Above

** See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

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GT = Greater Than



Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

5 NOE 1904

REPORT of ANALYSIS

Chemlab Ref.# :93.4328-7

Client Sample ID :LAY-BKGD-SW01 POINT LAY DUPLICATE

Matrix :WATER

Client Name :ICF KAISER ENGINEERING Ordered By :RAY MORRIS Project Name :DEW LINE RI/FS Project# :41096-412-01

PWSID

:UA

WORK Order Report Completed :09/17/93

Received

:70060

Collected :08/23/93 @ 13:15 hr :08/25/93 @ 12:00 hr

5633 B STREET ANCHORAGE, AK 99518

TEL: (907) 562-2343

FAX: (907) 561-5301

Technical Director: STEPHEN £. EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN.

QC Allowable Ext. Anal Parameter Results Qual Units Method Limits Date Date -----Total Metals Analysis ICP Screen, ICF EPA n/a 0.41 mg/L EPA 6010 0.10 U mg/L EPA 6010 0.10 U mg/L EPA 6010 Aluminum 09/02 09/06 DLC Antimony 09/02 09/06 DLC 0.10 U mg/L EPA 6010
0.050 U mg/L EPA 6010
0.050 U mg/L EPA 6010
0.050 U mg/L EPA 6010
5.3 mg/L EPA 6010
0.050 U mg/L EPA 6010
0.050 U mg/L EPA 6010
0.10 U mg/L EPA 6010
2.0 mg/L EPA 6010
2.0 mg/L EPA 6010
0.10 U mg/L EPA 6010
5.1 mg/L EPA 6010
5.1 mg/L EPA 6010
0.11 mg/L EPA 6010
0.11 mg/L EPA 6010
0.050 U mg/L EPA 6010
0.050 U mg/L EPA 6010
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0.050 U mg/L EPA 6010
0.050 U mg/L EPA 6010
0.050 U mg/L EPA 6010
0.050 U mg/L EPA 6010 Arsenic 0.10 U mg/L 09/02 09/06 DLC Barium 09/02 09/06 DLG Beryllium 09/02 09/06 DLG Cadmium 09/02 09/06 DLG Calcium 09/02 09/06 DLG Chromium 09/02 09/06 G Cobalt 09/02 09/06 ΣG Copper 09/02 09/06 DLG Iron 09/02 09/06 DLG Lead 09/02 09/06 DLG Magnesium 09/02 09/06 DLG Manganese 09/02 09/06 DLG Molybdenum 09/02 09/06 DLG Nickel 09/02 09/06 DLG Potassium 09/02 09/06 DLG Selenium 09/02 09/06 DLG Silver 09/02 09/06 DLG Sodium 09/15 09/17 DFL Thallium 09/02 09/03 KAW Vanadium 09/02 09/06 DLG Zinc 09/15 09/17 DET. Dissolved Metals Analys ICP Screen, ICF EPA n/a 0.32 Aluminum mg/L EPA 6010 09/02 09/06 DLG Antimony 0.10 U mg/L EPA 6010 09/02 09/06 DLG Arsenic 0.10 U mg/L EPA 6010 09/02 09/06 DLG Barium 0.050 U mg/L EPA 6010 09/02 09/06 DLG Beryllium 0.050 U mg/L EPA 6010 09/02 09/06 DLG 0.050 U Cadmium mg/L EPA 6010 09/02 09/06 DLG Calcium 5.3 mg/L EPA 6010 09/02 09/06 DLG mg/L mg/L mg/L Chromium 0.050 U EPA 6010 09/02 09/06 DLG EPA 6010 Cobalt 0.10 U 09/02 09/06 DLG Copper 0.050 U EPA 6010 09/02 09/06





ENVIRONMENTAL LABORATORY SERVICES

5 NOE 1908	D.	DODE - 6 NO	CVOTO			
Chemlab Ref.# :93.432 Client Sample ID :LAY-BK Matrix :WATER	8-7	PORT of ANA			5533 B ST ANCHORAGE, AK 9 TEL: (907) 562 FAX: (907) 561	99513 2-2343
Iron Lead Magnesium Hanganese Molybdenum Nickel Potassium Selenium Silver Sodium Thallium Vanadium Zinc	1.6 0.10 U 4.9 0.12 0.050 U 0.050 U 0.10 U 0.050 U 17 0.0050 U 0.050 U 0.050 U	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010		09/02 09/06 09/02 09/06 09/02 09/06 09/02 09/06 09/02 09/06 09/02 09/06 09/02 09/06 09/02 09/06 09/02 09/06 09/02 09/06 09/15 09/17	DLG DLG DLG DLG DLG DLG DLG DLG DLG DLG
TOC, NonpurgableTOC RangeTOC Concentration	38.7-40.3 39.6	mg/L mg/L	EPA 9060 EPA 9060 EPA 9060	n/a	09/07 09/07	CMR CMR

See Special Instructions Above

See Sample Remarks Above

= Undetected, Reported value is the practical quantification limit.

= Secondary dilution.

UA = Unavailable

NA = Not Analyzed

LT = Less Than

GT = Greater Than



Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS Chemlab Ref.# :93.4329-2

Client Sample ID :LAY-BKGD-SW01 POINT LAY SPIKE

Matrix :WATER

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2340 FAX: (907) 561-530

Client Name Ordered By Project Name :ICF KAISER ENGINEERING

:RAY MORRIS :DEW LINE RI/FS

Project# :41096-412-01

PWSID :UA WORK Order **:700**56

Report Completed :09/13/93

:08/23/93 Collected @ 13:15 hr **:08/**25/93 Received @ 12:00 hr

Technical Director: STEPHEN C. Released By : STEPHEN C. EDE

Sample Remarks: SAMPLE COLLECTED BY: S.S. SEPPOVEN. SEE QC PACKAGE FOR SPIKE

CONCENTRATION.

 Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Ini
Semivolatile Organics				EPA 8270				
Phenol	0.130		mg/L	EPA 8270		08/28	08/30	MT
bis(2-Chloroethyl)ether	0.031	U	mg/L	EPA 8270			08/30	HT
2-Chlorophenol	0.186		mg/L	EPA 8270			08/30	MT
1,3-Dichlorobenzene	0.031	U	mg/L	EPA 8270			08/30	MT
1,4-Dichlorobenzene	0.182		mg/L	EPA 8270			08/30	MT
Benzyl Alcohol	0.031	U	mg/L	EPA 8270			08/30	MT
1,2-Dichlorobenzene	0.031	U	mg/L	EPA 8270			08/30	MT
2-Methylphenol	0.031	U	mg/L	EPA 8270			08/30	T
bis(2-Chloroisopropyl)e	0.031	U	mg/L	EPA 8270			08/30	Tim
4-Methylphenol	0.031	U	mg/L	EPA 8270			08/30	MT
n-Nitroso-di-n-Propylam	0.229		mg/L	EPA 8270			08/30	MT
Hexachloroethane	0.031	ប	mg/L	EPA 8270		08/28	08/30	HT
Nitrobenzene	0.031	U	mg/L	EPA 8270			08/30	MT
Isophorone	0.031	U	mg/L	EPA 8270			08/30	MT
2-Nitrophenol	0.031	U	mg/L	EPA 8270				MT
2,4-Dimethylphenol	0.031	U	mg/L	EPA 8270		08/28	08/30	HT
Benzoic Acid	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
bis(2-Chloroethoxy)Meth	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
2,4-Dichlorophenol	0.031	U	mg/L	EPA 8270		08/28	08/30	MT
1,2,4-Trichlorobenzene	0.195		mg/L	EPA 8270		08/28	08/30	TK
Naphthalene	0.031	U	mg/L	EPA 8270			08/30	MT
4-Chloroaniline	0.031	U	mg/L	EPA 8270		08/28		MT
Hexachlorobutadiene	0.031	U	mg/L	EPA 8270			08/30	MT
4-Chloro-3-Methylphenol	0.221		mg/L	EPA 8270		08/28		MT
2-Methylnaphthalene	0.031	U	mg/L	EPA 8270		08/28		MT
Hexachlorocyclopentadie	0.031	U	mg/L	EPA 8270		08/28		MT
2,4,6-Trichlorophenol	0.031	U	mg/L	EPA 8270			08/30	MT
2,4,5-Trichlorophenol	0.031	U	mg/L	EPA 8270			08/30	MT
2-Chloronaphthalene	0.031	U	mg/L	EPA 8270			08/30	MT
2-Nitroaniline	0.031	U	mg/L	EPA 8270			08/30	MT
Dimethylphthalate	0.031	Ü	mg/L	EPA 8270		08/28		MT
Acenaphthylene	0.031	U	mg/L	EPA 8270		08/28		MT
2,6-Dinitrotoluene	0.031	U	mg/L	EPA 8270		08/28		MT
3-Nitroaniline	0.031	U	mg/L	EPA 8270		08/28		MT
Acenaphthene	0.201		mg/L	EPA 8270			08/30	MT.
2,4-Dinitrophenol	0.031	U	mg/L	EPA 8270		08/28	08/30	T^{-}
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ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS SICK Chemlab Ref.# :93.4329-2 5633 B STREET Client Sample ID :LAY-BKGD-SW01 POINT LAY SPIKE ANCHORAGE, AK 99518 TEL: (907) 562-2340 Matrix :WATER FAX: (907) 561-530° 4-Nitrophenol 0.114 mg/L EPA 8270 08/28 08/30 MI Dibenzofuran 0.031 U mg/L **EPA 8270** 08/28 08/30 MT 2,4-Dinitrotoluene 0.234 mg/L EPA 8270 08/28 08/30 MT Diethylphthalate 0.031 U mg/L **EPA 8270** 08/28 08/30 MT 4-Chlorophenyl-Phenylet 0.031 mg/L EPA 8270 08/28 08/30 MI Fluorene 0.031 U mg/L EPA 8270 08/28 08/30 MI 4-Nitroaniline 0.031 U mg/L EPA 8270 08/28 08/30 MT 4,6-Dinitro-2-Methylphe 0.031 U mg/L EPA 8270 08/28 08/30 MT n-Nitrosodiphenylamine 0.031 Ħ mg/L **EPA** 8270 08/28 08/30 MT 4-Bromophenyl-Phenyleth 0.031 U mg/L EPA 8270 08/28 08/30 MI Hexachlorobenzene 0.031 mg/L EPA 8270 08/28 08/30 MT Pentachlorophenol 0.150 mg/L EPA 8270 08/28 08/30 MT Phenanthrene 0.031 U mg/L EPA 8270 08/28 08/30 MT Anthracene 0.031 mg/L EPA 8270 08/28 08/30 MI di-n-Butylphthalate 0.258 mg/L **EPA 8270** 08/28 08/30 MT Fluoranthene 0.031 Ħ mg/L **EPA** 8270 08/28 08/30 MT Pyrene 0.244 mg/L **EPA 8270** 08/28 08/30 MT Butylbenzylphthalate 0.031 H mg/L **EPA** 8270 08/28 08/30 MT 3,3-Dichlorobenzidine 0.031 H mg/L **EPA** 8270 08/28 08/30 MT Benzo(a)Anthracene 0.031 U mg/L EPA 8270 08/28 08/30 MT Chrysene 0.031 U mg/L **EPA** 8270 08/28 08/30 MT bis(2-Ethylhexyl)Phthal 0.031 U mg/L **EPA** 8270 08/28 08/30 MT di-n-Octylphthalate 0.031 U mg/L EPA 8270 08/28 08/30 MT Benzo(b)Fluoranthene 0.031 U mg/L **EPA** 8270 08/28 08/30 MT Benzo(k)Fluoranthene 0.031 U mg/L EPA 8270 08/28 08/30 MT Benzo(a)Pyrene 0.031 U mg/L EPA 8270 08/28 08/30 MT Indeno(1,2,3-cd)Pyrene 0.031 U mg/L EPA 8270 08/28 08/30 MT Dibenz(a,h)Anthracene 0.031 U mq/L EPA 8270 08/28 08/30 MT

See Special Instructions Above See Sample Remarks Above

Benzo(g,h,i)Perylene

U = Undetected, Reported value is the practical quantification limit. D = Secondary dilution.

0.031

U

mg/L

EPA 8270

UA = Unavailable

NA = Not Analyzed LT = Less Than

08/28 08/30

MT

GT = Greater Than





ENVIRONMENTAL LABORATORY SERVICES



REPORT of ANALYSIS

Chemlab Ref.#

:93.4328-6

Client Sample ID :LAY-BKGD-SW01 POINT LAY SPIKE

Matrix

:WATER

5633 B STREET ANCHORAGE, AK 9951

TEL: (907) 562-234 F4X: (907) 561-530

Client Name

:ICF KAISER ENGINEERING

Ordered By Project Name

:RAY MORRIS :DEW LINE RI/FS :41096-412-01

Project# PWSID

:UA

WORK Order

:70060

Report Completed :09/20/93 Collected

:08/23/93 @ 13:15 hr :08/25/93 @ 12:00 hr

Received

Technical Director: STEPHEN C. EDE
Released By : Stephen C. AL

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN.

Parameter	Qu Results Qu		Method	Allowable Limits	Ext. Date	Anal Date	Ini
Total Metals Analysis ICP Screen, ICF			_				
Aluminum	1 25	~-	EPA	n/a			
Antimony	1.35	mg/L	EPA 6010			09/06	DL
Arsenic	0.88	mg/L	EPA 6010			09/06	DL
Barium	0.93 1.03	mg/L	EPA 6010			09/06	DL
Beryllium	0.39	mg/L	EPA 6010			09/06	DL
Cadmium	0.49	mg/L	EPA 6010			09/06	DL
Calcium	15.0	mg/L	EPA 6010			09/06	DL
Chromium	1.00	mg/L	EPA 6010			09/06	DL:
Cobalt	0.98	mg/L	EPA 6010			09/06	D L.
Copper	0.96	mg/L	EPA 6010			09/06	DL
Iron	2.93	mg/L	EPA 6010			09/06	DL
Lead	0.92	mg/L	EPA 6010			09/06	DL
Magnesium	13.9	mg/L	EPA 6010			09/06	DL(
Manganese	1.13	mg/L mg/L	EPA 6010 EPA 6010			09/06	DL(
Molybdenum	0.99	mg/L	EPA 6010			09/06	DL(
Nickel	0.99	mg/L	EPA 6010			09/06	DL(
Potassium	8.3	mg/L	EPA 6010			09/06	DL(
Selenium	0.89	mg/L	EPA 6010			09/06 09/06	DLC
Silver	0.13	mg/L	EPA 6010			09/06	DLC
Sodium	27	mg/L	EPA 6010			09/17	DLC
Thallium	0.017	mg/L	EPA 7841			09/03	DFI K A F
Vanadium	0.96	mg/L	EPA 6010			09/05	DLC
Zinc	0.97	mg/L	EPA 6010			09/17	DEL
			Lan out		03/13	03/17	DEL
Dissolved Metals Analys			-				
ICP Screen, ICF			EPA	n/a			
Aluminum	1.4	mg/L	EPA 6010	, 🗷	09/02	09/06	DLG
Antimony	0.89	mg/L	EPA 6010		09/02		DLG
Arsenic	0.90	mg/L	EPA 6010		09/02		DLC
Barium	1.05	mg/L	EPA 6010		09/02		DLG
Beryllium	0.40	mg/L	EPA 6010		09/02		DLG
Cadmium	0.50	mg/L	EPA 6010		09/02		DLG
Calcium	15.0	mg/L	EPA 6010		09/02		DLG
Chromium	1.01	mg/L	EPA 6010		09/02		DLG
Cobalt	1.00	mg/L	EPA 6010		09/02		DLG
Copper	1.00	mg/L	EPA 6010				LG
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ENVIRONMENTAL LABORATORY SERVICES

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Chemlab Ref.# Client Sample ID Matrix	:93.4328-6 :LAY-BKGD-SW01 :WATER	REPO POINT LA		Lysis Mc		5633 B ST ANCHORAGE, AK TEL: (907) 56: FAX: (907) 56:	995:8 2-2343
Iron Lead Magnesium Manganese Molybdenum Nickel Potassium Selenium Silver Sodium Thallium Vanadium Zinc	0	2.6 0.94 14.1 1.17 0.98 1.01 8.7 0.90 0.13 27 .016 0.97	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010	09 09 09 09 09 09	9/02 09/06 9/02 09/06 9/02 09/06 9/02 09/06 9/02 09/06 9/02 09/06 9/02 09/06 9/02 09/06 9/02 09/06 9/02 09/06 9/02 09/06	DL DL DL DL DL DL DL DL DL DF KA DL DF
TOC, NonpurgablTOC RangeTOC Concentr	52.6-	56.7 5 4. 3	mg/L mg/L	EPA 9060 EPA 9060 EPA 9060	n/a	09/07 09/07	CH:

See Special Instructions Above See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable NA = Not Analyzed LT = Less Than

GT = Greater Than



SGS Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.#

:93.4329-3

Client Sample ID :LAY-BKGD-SW01 POINT LAY SPIKE DUPLICATE

Matrix :WATER

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

Client Name Ordered By

:ICF KAISER ENGINEERING

Project Name Project#

:RAY MORRIS :DEW LINE RI/FS :41096-412-01

PWSID

:UA

WORK Order

Report Completed

:70056

:09/21/93

:08/23/93 @ 13:15 hr

Collected Received

:08/25/93 @ 12:00 hr Technical Director: STEPHEN C. EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: S.S. SEPPOVEN. SEE QC PACKAGE FOR SPIKE

CONCENTRATION. CORRECTED DUPLICATE TO SPIKE DUPLICATE.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Ini
Semivolatile Organics				EPA 8270				
Phenol	0.167		mg/L	EPA 8270		08/28	08/30	MT
bis(2-Chloroethyl)ether	0.035	U	mg/L	EPA 8270			08/30	MT
2-Chlorophenol	0.231		mg/L	EPA 8270			08/30	MT
1,3-Dichlorobenzene	0.035	U	mg/L	EPA 8270			08/30	MI
1,4-Dichlorobenzene	0.209		mg/L	EPA 8270			08/30	MT
Benzyl Alcohol	0.035	บ	mg/L	EPA 8270			08/30	MT
1,2-Dichlorobenzene	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
2-Methylphenol	0.035	U	mg/L	EPA 8270		08/28	08/30	HT
<pre>bis(2-Chloroisopropyl)e</pre>	0.035	U	mg/L	EPA 8270		08/28	08/30	HT
4-Methylphenol	0.035	U	mg/L	EPA 8270		08/28	08/30	HT
n-Nitroso-di-n-Propylam	0.244		mg/L	EPA 8270		08/28	08/30	HT
Hexachloroethane	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
Nitrobenzene	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
Isophorone	0.035	U	mg/L	EPA 8270	•	08/28	08/30	MT
2-Nitrophenol	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
2,4-Dimethylphenol	0.035	ប	mg/L	EPA 8270		08/28	08/30	MT
Benzoic Acid	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
bis(2-Chloroethoxy)Meth	0.035	Ü	mg/L	EPA 8270			08/30	MT
2,4-Dichlorophenol	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
1,2,4-Trichlorobenzene	0.231		mg/L	EPA 8270			08/30	MT
Naphthalene	0.035	U	mg/L	EPA 8270			08/30	MT
4-Chloroaniline	0.035	Ü	mg/L	EPA 8270			08/30	MT
Hexachlorobutadiene	0.035	Ü	mg/L	EPA 8270			08/30	MT
4-Chloro-3-Methylphenol	0.254		mg/L	EPA 8270			08/30	MT
2-Methylnaphthalene	0.035	Ü	mg/L	EPA 8270			08/30	MT
Hexachlorocyclopentadie	0.035	U	mg/L	EPA 8270			08/30	MT
2,4,6-Trichlorophenol	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
2,4,5-Trichlorophenol	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
2-Chloronaphthalene	0.035	ប	mg/L	EPA 8270		08/28	08/30	MT
2-Nitroaniline	0.035	ប	mg/L	EPA 8270			08/30	MT
Dimethylphthalate	0.035	ប	mg/L	EPA 8270		08/28	08/30	MT
Acenaphthylene	0.035	ប	mg/L	EPA 8270		08/28	08/30	MT
2,6-Dinitrotoluene	0.035	U	mg/L	EPA 8270		08/28	08/30	MT
3-Nitroaniline	0.035	Ü	mg/L	EPA 8270			08/30	MT
Acenaphthene	0.239		mg/L	EPA 8270			08/30	MT
2,4-Dinitrophenol	0.035	U	mg/L	EPA 8270			08/30	MT



ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.#

REPORT of ANALYSIS

Matrix

:93.4329-3

Client Sample ID :LAY-BKGD-SW01 POINT LAY SPIKE DUPLICATE

:WATER

5633 B STREET ANCHORAGE. AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

					()
4-Nitrophenol Dibenzofuran 2,4-Dinitrotoluene Diethylphthalate 4-Chlorophenyl-Phenylet Fluorene 4-Nitroaniline 4,6-Dinitro-2-Methylphe n-Nitrosodiphenylamine 4-Bromophenyl-Phenyleth Hexachlorobenzene Pentachlorophenol Phenanthrene Anthracene di-n-Butylphthalate Fluoranthene Pyrene Butylbenzylphthalate 3,3-Dichlorobenzidine Benzo(a)Anthracene Chrysene bis(2-Ethylhexyl)Phthal di-n-Octylphthalate Benzo(b)Fluoranthene Benzo(a)Pyrene Benzo(a)Pyrene	0.177 0.035 0.241 0.035 0.035 0.035 0.035 0.035 0.035 0.035 0.035 0.035 0.035 0.035 0.035 0.035 0.035	מממממממ מ ממ ממממממ מ	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	EPA 8270 EPA 8270	08/28 08/30 MT 08/28 08/30 MT
Benzo(k)Fluoranthene	0.035 0.035	Ü	mg/L	EPA 8270 EPA 8270	08/28 08/30 MT

See Special Instructions Above

See Sample Remarks Above

= Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed

LT = Less Than

GT = Greater Than



Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES



hrs

REPORT of ANALYSIS

Chemlab Ref.#

:93.4328-8

Client Sample ID :LAY-BKGD-SW02 POINT LAY

Matrix

:WATER

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

Client Name Ordered By

:ICF KAISER ENGINEERING :RAY MORRIS

WORK Order :70060

Project Name

:DEW LINE RI/FS

Report Completed :09/20/93 Collected :08/23/93

Project#

:41096-412-01

@ 11:15

PWSID

:UA

Received :08/25/93 @ 12:00 hrs Technical Director:STEPHEN C. EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	In it
Volatile Organics								
Benzene	0.0010	11	45	EPA 8260				
Bromobenzene	0.0010	U U	mg/L	EPA 8260		09/02	09/02	KWM
Bromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Bromodichloromethane	0.0010	Ü	mg/L	EPA 8260			09/02	KWM
Bromoform	0.0010	ti	mg/L	EPA 8260			09/02	KWM
Bromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
sec-Butylbenzene	0.0010	_	mg/L	EPA 8260		09/02	09/02	KWM
tert-Butylbenzne	0.0010	U U	mg/L	EPA 8260		09/02	09/02	
Carbon Tetrachloride	0.0010	_	mg/L	EPA 8260		09/02	09/02	M M
Chlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
Chloroethane		ប	mg/L	EPA 8260		09/02	09/02	KWM
Chloroform	0.0010	U	mg/L	EPA 8260		09/02		KWM
Chloromethane	0.0010	Ü	mg/L	EPA 8260		09/02	09/02	KWM
2-Chlorotoluene	0.0010	Ü	mg/L	EPA 8260		09/02	09/02	KWM
4-Chlorotoluene	0.0010	Ü	mg/L	EPA 8260		09/02		KWM
Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/02		KWM
12Dibromo3Chloropropane	0.0010	U	mg/L	EPA 8260		09/02		KWM
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/02		KWM
Dibromomethane	0.0010	U	mg/L	EPA 8260		09/02		KWM
1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02		KWM
1.3-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02		KWM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02		KWM
Dichlorodifluoromethane	0.0010	U	mg/L	EPA 8260		09/02		KWH
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02		KWM
1,2-Dichloroethane	0.0010	Ü	mg/L	EPA 8260		09/02		KWM
1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02		KWM
Cis-1 ? Dishlamashara	0.0010	U	mg/L	EPA 8260		09/02		KWM
cis-1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02		KWM
trans1,2-Dichloroethene	0.0010	Ü	mg/L	EPA 8260		09/02	09/02	KWM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02		KWM
1,3-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02		KWH
2,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02		KWM
1,1-Dichloropropene	0.0010	U	mg/L	EPA 8260		09/02		KWM
Ethylbenzene	0.0010	U	mg/L	EPA 8260		09/02		KWM
Hexachlorobutadiene	0.0010	U	mg/L	EPA 8260		09/02		KWH
Isopropylbenzene	0.0010	U	mg/L	EPA 8260		09/02		NAUI
p-Isopropyltoluene	0.0010	U	mg/L	EPA 8260		09/02		
			- -			0 3 / 0 2	0 2/ 02	



ENVIRONMENTAL LABORATORY SERVICES

•	Chemlab Ref.# :93.432			REPOR	rof	ANALYSIS	SYA /				
	Chemiab Ref.# :93.431	28-8				-			ANCE	56 33 B ST IORAGE, AK	REET
•	Client Sample ID :LAY-BR	(GD-SW02	POI	T LAY					7.1101	EL: (907) 56	2-2343
	latrix :WATER								F	AX: (907) 56	1-5301
	Methylene Chloride	_									
	Napthalene		0010	U	mg/L		8260		09/02	09/02	KWI
			.0010	U	mg/L		8260			09/02	KWI
	n-Propylbenzene		.0010	U	mg/L	_ EPA	8260		09/02	09/02	KWI
	Styrene		.0010	U	mg/L		8260			09/02	KWI
	1112-Tetrachloroethane	0.	.0010	U	mg/L		8260			09/02	KWI
	1122-Tetrachloroethane	0.	0010	U	mg/L		8260			09/02	KWI
	Tetrachloroethene	0.	0010	U	mg/L	. EPA	8260			09/02	KWI
	Toluene	0.	0010	IJ	mg/L		8260			09/02	
	1,2,3-Trichlorobenzene	0.	0010	U	mg/L		8260		09/02	09/02	KWI
	1,2,4-Trichlorobenzene	0.	0010	U	mg/L		8260		09/02	09/02	KWI
	1,1,1-Trichloroethane		0010	U	ng/L		8260		09/02	09/02	KWI
	1,1,2-Trichloroethane		0010	Ū	mg/L		8260				KWI
	Trichloroethene	0	0010	Ū	mg/L		8260		09/02		KWI
	Trichlorofluoromethane	0	0010	Ü	mg/L		8260		09/02		KWI
	1,2,3-Trichloropropane	n n	0010	Ü	mg/L		8260		09/02		KWP
	1,2,4-Trimethylbenzene	0	0010	Ü	mg/L		8260		09/02		KWP
	1,3,5-Trimethylbenzene		0010	Ŭ	mg/L		8260		09/02		KWP
	Vinyl Chloride		0010	ŭ	mg/L		8260		09/02		KWE
	p+m-Xylene		0010		mg/L				09/02		KWM
	o-Xylene		0010	_	mg/L		8260		09/02		KWE
			0010	U	ing/ L	. ELM	8260		09/02	09/02	KWM
_	Total Metals Analysis										
	ICP Screen, ICF						- 	_ /-			
	Aluminum		0.13		mg/L		EPA 6010	n/a	00.400	00.404	
•	Antimony		0.10		mg/L		6010		09/02		DLG
	Arsenic		0.10		mg/L		6010 6010		09/02		DLG
	Barium		.056	_	mg/L				09/02		DLG
	Beryllium		.050		mg/L		6010		09/02		DLG
	Cadmium		.050		mg/L		6010		09/02		DLG
	Calcium	J	9.0	-			6010		09/02		DLG
	Chromium	0	.050		mg/L		6010		09/02		DLG
	Cobalt		0.10		mg/L		6010		09/02		DLG
	Copper		.050		mg/L		6010		09/02		DLG
	Iron	J	2.8	_	mg/L		6010		09/02		DLG
	Lead		0.10		mg/L		6010		09/02		DLG
	Magnesium		5.5		mg/L		6010		09/02		DLG
	Manganese		0.51		mg/L		6010		09/02		DLG
	Molybdenum				mg/L		6010		09/02		DLG
	Nickel		.050		mg/L		6010		09/02		DLG
	Potassium	U	5.0		mg/L		6010		09/02		DLG
	Selenium		0.10		mg/L		6010		09/02		DLG
	Silver		.050		mg/L		6010		09/02		DLG
	Sodium	U			mg/L		6010		09/02		DLG
	Thallium	٥	18		mg/L		6010		09/15		DFL
	Vanadium		0050		mg/L		7841		09/02		KAW
	Zinc		.050		mg/L		6010		09/02		DLG
			0.16		mg/L	EPA	6010		09/15	09/17	DFL
	Dissolved Metals Analys	-									
	ICP Screen, ICF	٥					-				
	Aluminum	•	0 10		1-		PA	n/a			
	Antimony				mg/L		6010		09/02		DLG
	· ····································		0.10	U	mg/L	EPA	6010		09/02	09/06	DLG





ENVIRONMENTAL LABORATORY SERVICES



Chemlab Ref.#	:93.4328-8	REF	ORT of A	nalysis & C	5633 B STREET
Client Sample ID	:LAY-BKGD-SW02 POIN	IT L	ΑY		ANCHORAGE, AK 99518 TEL: (907) 562-2343
Matrix	:WATER				FAX: (907) 561-5301
Arsenic	0.10	U	mg/L	EPA 6010	00/02/00/06
Barium	0.050	Ü	-		09/02 09/06 DL
Beryllium	0.050	Ü	ng/L	EPA 6010	09/02 09/06 DL
Cadmium	0.050	ti	mg/L	EPA 6010	09/02 09/06 DC
Calcium	8.6	U	mg/L	EPA 6010	09/02 09/06 DL
Chromium			mg/L	EPA 6010	09/02 09/06 DL
Cobalt	0.050	Ü	mg/L	EPA 6010	09/02 09/06 DL
Copper	0.10	Ü	mg/L	EPA 6010	09/02 09/06 DC
Iron	0.050	U	mg/L	EPA 6010	09/02 09/06 DC
Lead	0.95		mg/L	EPA 6010	09/02 09/06 DC
Magnesium	0.10	U	mg/L	EPA 6010	09/02:09/06 DL
Manganese	5.5		mg/L	EPA 6010	.09/02 .09/06 DC
Molybdenum	0.066		SCEG/L	. EPA ,6010	09/02/09/06 DC
Nickel	~~ ~ ∜.;0.050	U	:: mg/L	EPA 6010	09/02 09/06 DC
- · -	0.050	U	pg/L	EPA 6010	09/02 .09/06 · JDC
Potassium	5.0	U	mg/L	EPA 6010	09/02 09/06 VEDL
Selenium	0.10	U	mg/L	EPA 6010	.09/02 09/06 DL
Silver	0.050	U	mg/L	EPA 6010	.09/02:09/06 Dic
Sodium	19		ing/L	EPA 6010	09/15 09/17 DFT
Thallium	.0.0050	U	* BG/L	EPA 7841	:09/02 09/03 KA
Vanadium	0.050	U	mg/L	EPA 6010	09/02 09/06 DLC
Zinc	· · · · · · · · · · · · · · · · · · ·	U	mg/L	EPA 6010	09/15 09/17 DFT
A SECRETARY OF THE PARTY	سر المنظم	;	7.24 ···	4.00.0	
TOC, Nonpurgabl	e Angelia	٠.,	100	**************************************	h/a
TOC Range	28.9 –33.7		mg/L	EPA 9060	
TOC Concentr	ation 31.7		DQ/L	EPA 9060	09/07 CHF
Telegraphy (1997)					W. A. C. C. C. C. C. C. C. C. C. C. C. C. C.

** See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit. LT = Less Than

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed

GT = Greater Than



Member of the SGS Group (Société Générale de Surveillance)

^{*} See Special Instructions Above



ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.#

:93.4329-4

REPORT of ANALYSIS

Client Sample ID :LAY-BKGD-SW02 POINT LAY

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

Matrix

:WATER

WORK Order :70056

Report Completed

:09/13/93 :08/23/93

@ 11:15 hrs

Ordered By Project Name Project#

Client Name

:RAY MORRIS :DEW LINE RI/FS :41096-412-01

Received

:08/25/93 @ 12:00 hrs

PWSID

:UA

Collected

Technical Director:STEPHEN C. FDE
Released By : Market C. GAR

Sample Remarks: SAMPLE COLLECTED BY: S.S. SEPPOVEN.

:ICF KAISER ENGINEERING

Parameter	Results	Qual QC	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Semivolatile Organics				EPA 8270				
Phenol	0.020	U	mg/L	EPA 8270		08/29	08/30	Verter
bis(2-Chloroethyl)ether	0.020	Ū	mg/L	EPA 8270			08/30	MTT MTT
2-Chlorophenol	0.020	Ü	mg/L	EPA 8270			08/30	MII
1,3-Dichlorobenzene	0.020	Ū	mg/L	EPA 8270			08/30	
1,4-Dichlorobenzene	0.020	Ū	mg/L	EPA 8270			08/30	MII
Benzyl Alcohol	0.020	Ū	ng/L	EPA 8270			08/30	HII
1,2-Dichlorobenzene	0.020	Ū	mg/L	EPA 8270			08/30	MII
2-Methylphenol	0.020	Ū	mg/L	EPA 8270			08/30	MII
bis(2-Chloroisopropyl)e	0.020	Ū	mg/L	EPA 8270			08/30	MII
4-Methylphenol	0.020	Ū	mg/L	EPA 8270			08/30	MII
n-Nitroso-di-n-Propylam	0.020	U	mg/L	EPA 8270			08/30	MII
Hexachloroethane	0.020	Ū	mg/L	EPA 8270			08/30	HII
Nitrobenzene	0.020	U	mg/L	EPA 8270			08/30	MII
Isophorone	0.020	U	mg/L	EPA 8270			08/30	HTT
2-Nitrophenol	0.020	Ü	mg/L	EPA 8270			08/30	MTT
2,4-Dimethylphenol	0.020	Ū	mg/L	EPA 8270			08/30	MTT
Benzoic Acid	0.020	Ü	mg/L	EPA 8270			08/30	MTT
bis(2-Chloroethoxy)Meth	0.020	Ū	mg/L	EPA 8270			08/30	MTT
2,4-Dichlorophenol	0.020	Ū	mg/L	EPA 8270			08/30	MTT
1,2,4-Trichlorobenzene	0.020	Ü	mg/L	EPA 8270			08/30	MTT
Naphthalene	0.020	U	mg/L	EPA 8270			08/30	MTT
4-Chloroaniline	0.020	Ū	mg/L	EPA 8270			08/30	MII
Hexachlorobutadiene	0.020	บ	mg/L	EPA 8270			08/30	MTT
4-Chloro-3-Methylphenol	0.020	U	mg/L	EPA 8270			08/30	MTT
2-Methylnaphthalene	0.020	Ū	mg/L	EPA 8270			08/30	MTT
Hexachlorocyclopentadie	0.020	Ū	mg/L	EPA 8270			08/30	HII
2,4,6-Trichlorophenol	0.020	Ü	mg/L	EPA 8270			08/30	MTT
2,4,5-Trichlorophenol	0.020	Ü	mg/L	EPA 8270			08/30	MTT
2-Chloronaphthalene	0.020	Ü	mg/L	EPA 8270			08/30	MTT
2-Nitroaniline	0.020	Ū	mg/L	EPA 8270			08/30	MTT
Dimethylphthalate	0.020	U	mg/L	EPA 8270			08/30	MTT
Acenaphthylene	0.020	Ū	mg/L	EPA 8270			08/30	MTT
2,6-Dinitrotoluene	0.020	Ü	mg/L	EPA 8270			08/30	MTT
3-Nitroaniline	0.020	Ü	mg/L	EPA 8270			08/30	
Acenaphthene	0.020	Ü	mg/L	EPA 8270			08/30	MTT
2,4-Dinitrophenol	0.020	Ü	mg/L	EPA 8270				MTT
4-Nitrophenol	0.020	ij	mg/L	EPA 8270			08/30 08/30	MTT
		-		MA 0270		UO/ 28	00/30	MIT



ENVIRONMENTAL LABORATORY SERVICES



REPORT of ANALYSIS

Chemlab Ref.# :93.4329-4 Client Sample ID :LAY-BKGD-SW02 POINT LAY

Matrix :WATER

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

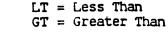
Dibenzofuran	0.020	U	mg/L	EPA 8270		08/28 08/	30 MT
2,4-Dinitrotoluene	0.020	Ü	mg/L	EPA 8270		08/28 08/	
Diethylphthalate	0.020	ŭ	mg/L	EPA 8270		08/28 08/	
4-Chlorophenyl-Phenylet	0.020	ü	mg/L	EPA 8270		08/28 08/	
Fluorene	0.020	Ü	mg/L	EPA 8270		08/28 08/	
4-Nitroaniline	0.020	Ü	ng/L	EPA 8270		08/28 08/	
4,6-Dinitro-2-Methylphe	0.020	บ	mg/L	EPA 8270		08/28 08/	
n-Nitrosodiphenylamine	0.020	Ü	ng/L	EPA 8270		08/28 08/	
4-Bromophenyl-Phenyleth	0.020	Ü	mg/L	EPA 8270		08/28 08/	
Hexachlorobenzene	0.020	Ü	mg/L	EPA 8270		08/28 08/	
Pentachlorophenol	0.020	Ü		EPA 8270		08/28 08/	
Phenanthrene	0.020	Ü	mg/L			08/28 08/	
Anthracene	0.020	บ	mg/L	EPA 8270		08/28 08/	
di-n-Butylphthalate	0.020	U	mg/L	EPA 8270			
Fluoranthene	0.020	U	mg/L	EPA 8270		08/28 08/	
Pyrene	0.020	_	mg/L	EPA 8270		08/28 08/	
Butylbenzylphthalate	0.020	ប	mg/L	EPA 8270		08/28 08/	
3,3-Dichlorobenzidine	0.020	U U	mg/L	EPA 8270		08/28 08/	
Benzo(a)Anthracene		_	mg/L	EPA 8270		08/28 08/	
Chrysene	0.020 0.020	U	mg/L	EPA 8270		08/28 08/	
bis(2-Ethylhexyl)Phthal		U	mg/L	EPA 8270		08/28 08/	
di-n-Octylphthalate	0.020	Ü	mg/L	EPA 8270		08/28 08/	
Benzo(b)Fluoranthene	0.020	Ü	mg/L	EPA 8270		08/28 08/	
Benzo(k)Fluoranthene	0.020	U	mg/L	EPA 8270		08/28 08/	
	0.020	U	ng/L	EPA 8270		08/28 08/	
Benzo(a)Pyrene	0.020	U	mg/L	EPA 8270		08/28 08/	
Indeno(1,2,3-cd)Pyrene	0.020	U	mg/L	EPA 8270		08/28 08/	
Dibenz(a,h)Anthracene	0.020	U	mg/L	EPA 8270		08/28 08/	
Benzo(g,h,i)Perylene	0.020	U	mg/L	EPA 8270		08/28 08/	30 HT
Residue, Non-Filterable	77		4	FFD 160 0		00/20 00/	31 ~~~
Residue, Filterable(TDS)	77		mg/L	EPA 160.2	F00	08/30 08/	
"cardde't irrerante(ID2)	151		mg/L	EPA 160.1	5 00	09/01 09/	02 R JI

** See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable NA = Not Analyzed





See Special Instructions Above

ICF ID	LAY-BKGD-S01	LAY-BKGD-S02	LAY-BKGD-S03	LAY-BKGD-S04	
F&BI Number	433	435	437	439	
Sample Type	soil	soil	soil	soil	
Date Received	8/24/93	8/24/93	8/24/93	8/24/93	
% Dry Weight	64	46	52	75	
Sequence Date	#5-08/24/93	#5-08/24/93	#5-08/24/93	#5-08/24/93	
Leaded Gas	0 00,2 1,00	0 00/2 1/00	" O OO/ L 1/ OO	# C CO/L 1,00	
JP-4	<80	<100	<100	<100	
Lube Oil	< 100	<100	<100	<100	
Diesel	<80	<100	<100	£100 < 7	₹0
Spike Level	100	1,00	1,00	2.00	
Unknown Semi-volatile	40 biological	270 biological	60 biological	90 biological	
Pentacosane	113	103	90	107	
Sequence Date	#5-08/24/93	#5-08/24/93	#5-08/24/93	#5-08/24/93	
PCB 1221	<0.1	<0.1 40.₹	<0. 1 <0.2	<0.1	
PCB 1232	<0.1	<0.1 40.2	< 0.1 ∠0.7	<0.1	
PCB 1016	<0.1	<0.1 40.2	<0.1 ∠0.2	< 0.1	
PCB 1242	<0.1	<0.1 43.2	<0.1 <0.2	<0.1	
PCB 1248	<0.1	<0.1 <0.2	<0.1 60.2		
PCB 1254	<0.1	<0.1 40.2			
PCB 1260	<0.1	ج <u>ه</u> ۲۵۰ د ۵۰ د		<0.1	
Spike Level		2011			
Dibutyl Chlorendate	150	120	120	124	
Sequence Date	#5-08/24/93	#5-08/24/93	#5-08/24/93	#5-08/24/93	
alpha-BHC	< 0.02 5	< 0.02 \(\tau \)	<0.02 \(\mathcal{T} \)	<0.025	
beta-BHC	<0.02 ℑ	< 0.02 3	< 0.02 5	<0.02 🎝	
gamma-BHC	< 0.02 \(\mathcal{I} \)	< 0.02 \(\mathcal{I} \)	<0.02 J	< 0.02 \$	
delta-BHC	< 0.02 \(\tau \)	< 0.02 5	<0.02 \(\mathcal{T} \)	<0.02 J	
Heptachlor	< 0.02 5	<0.02 \\ \)	<0.02 3	<0.02 3	
Aldrin	< 0.02 J	<0.02 J	<0.02 5	<0.02 5	
Heptachlor Epoxide	<0.02 ₮	<0.02 \(\mathcal{I} \)	<0.02 3	<0.02 \(\mathcal{I} \)	
Endosulfan I	<0.02 J	< 0.02 5	<0.02 5	<0.02 \(\mathcal{I} \)	
DDE	<0.02丁	< 0.02 \(\textstyle{5} \)	<0.02 \(\mathcal{I} \)	<0.02 \(\tau \)	
Dieldrin	<0.025	<0.02 \(\mathcal{I} \)	<0.02 \(\mathcal{I} \)	<0.02 \(\mathcal{Z} \)	
Endrin	<0.02す	<0.02 \(\mathcal{T} \)	<0.02 5	< 0.02 \(\mathcal{T} \)	
Endosulfan il	<0.02ゴ	< 0.02 3	<0.02 \(\mathcal{T} \)	<0.02 J	
DDD	<0.02 ፓ	<0.02 \mathcal{I}	<0.02 \(\mathcal{J} \)	<0.02 J	
Endrin Aldehyde	<0.02 🤰	<0.02 J	<0.02 \(\bar{2} \)	< 0.02 5	
DDT	<0.02 ን	<0.02 5	< 0.02 5	<0.02 5	
Endosulfan Sulfate	<0.02 \mathcal{I}	く0.02 ナ	<0.02 \(\mathcal{I} \)	<0.02 \$	
Endrin Ketone	<0.02 \mathcal{I}	<0.02 \(\mathcal{T} \)	< 0.02 5	<0.02 J	
Methoxy Chlor	<0.5	<0.7 € <0.5	< 0.1 <0.5	~0.1 <0.5	•
Chlordane	<0.5 T	<0.5 プ	< 0.5 \(\mathcal{Z} \)	<0.5 <i>J</i>	
Dibutyl Chlorendate	150	120	120	124	
Spike Level					
Vol Sequence	#1&2-08/24/93	#1&2-08/24/93	#1&2-08/24/93	#1&2-08/24/93	
CCI4	< 0.03	< 0.04	< 0.04	< 0.03	
TCA	< 0.03	< 0.04	< 0.04	< 0.03	
Benzene	< 0.02	< 0.04	< 0.04	< 0.03	
TCE	< 0.03	< 0.04	< 0.04	< 0.03	
Toluene	< 0.02	< 0.04	< 0.04	< 0.03	
PCE	< 0.03	< 0.04	< 0.04	< 0.03	
Ethylbenzene	< 0.03	< 0.04	< 0.04	< 0.04	
Xylenes	< 0.06	< 0.08	<0.08	< 0.08	
Gasoline	<3 乙	<4 3	<4 J	<3 Z	RJO
Spike level					
BFB	102	101	97	105	6-14-95

ICF ID	LAY-BKGD-SD01	LAY-BKGD-SW01	LAT-BKGD-SW01
F&Bl Number	431	448	457
Sample Type	soil	water	water
Date Received	8/24/93	8/24/93	8/24/93
% Dry Weight	64		
Sequence Date	#5-08/24/93		#5-08/25/93
Leaded Gas			
JP-4	< 50		< 1000
Lube Oil	<100		< 2000
Diesel	< 50		<1000
Spike Level			
Unknown Semi-volatile			
Pentacosane	103		76
Sequence Date	#5-08/24/93		#5-08/25/93
PCB 1221	< 0.1		<2
PCB 1232	< 0.1		<2
PCB 1016	< 0.1		< 2
PCB 1242	< 0.1		<2
PCB 1248	< 0.1		<2
PCB 1254	< 0.1		<2
PCB 1260	< 0.1		<2
Spike Level			
Dibutyl Chlorendate	112		68
Sequence Date	#5-08/24/93		#5-08/25/93
alpha-BHC	<0.02 了		<\$ <0.52
beta-BHC	<0.02 J		<2 40.23
gamma-BHC	<0.02 ♂		<2 <0.25
delta-BHC	<0.02 3		<2 40.25
Heptachlor	<0.02 \(\mathcal{I} \)		<2 <0.23
Aldrin	<0.02 J		<2 <0.25
Heptachlor Epoxide	<0.02 \(\mathcal{I} \)		<2 <0.2 J <2 <0.2 J <2 <0.2 J <2 <0.2 J
Endosulfan I	<0.02 \(\mathcal{I} \)		<2 < 0.2.5
DDE	<0.02 \(\mathcal{T} \)		< 2 < 0.2 2
Dieldrin	<0.02 J		 2 5.0 > 4>
Endrin	<0.02 プ		<\$ <0.23
Endosulfan II	<0.02 丁		<2 <0.23
DDD	<0.02 J		<2 <0.25 <2 <0.25 <2 <0.25
Endrin Aldehyde	<0.02 J		<2 <0.23
DDT	<0.02 J		<3 (0.25
Endosulfan Sulfate	< 0.02 <u>J</u>		<2 <0.25
Endrin Ketone	<0.02 \(\sqrt{2} \)	_	<2 <0.23
Methoxy Chlor	20.7 40.5		<10 J
Chlordane	< 0.5 < 0.5	7	<50 J
Dibutyl Chlorendate	112		68
Spike Level			
Vol Sequence	#3&4-08/27/93	#3&4-08/24/93	
CCI4	< 0.03	<1	
TCA	< 0.03	<1	
Benzene	< 0.03	<1	
TCE	< 0.03	<1	
Toluene	< 0.03	<1	
PCE	< 0.03	<1	
Ethylbenzene	< 0.03	<1	
Xylenes	< 0.04	<2	
Gasoline	<3 五	<50.3	
Spike level	70	100	
BFB	70	108	

ICF ID	LAY-BKGD-SW02	LAY-BKGD-SW02
F&BI Number	461	462
Sample Type	water	water
Date Received	8/24/93	8/24/93
% Dry Weight		
Sequence Date		#5-08/25/93
Leaded Gas		
JP-4		<1000
Lube Oil		< 2000
Diesel		<1000
Spike Level		
Unknown Semi-volatile		
Pentacosane		78
Sequence Date		#5-08/25/93
PCB 1221		< 2
PCB 1232		<2
PCB 1016		<2
PCB 1242		<2
PCB 1248		<2
PCB 1254		<2
PCB 1260		<2
Spike Level		
Dibutyl Chlorendate		82
Sequence Date		#5-08/25/93
alpha-BHC		< 2 < 0.2 3
beta-BHC		<2 40.23
gamma-BHC		<2 <0.2 5
delta-BHC		<5 <0.52
Heptachlor		<2 (0.23
Aldrin		<2 <0.2 3 <2 <0.2 3
Heptachlor Epoxide		<2 40.2 5
Endosulfan I		<2 <3.23
DDE		< 2 < 0.2 3
Dieldrin		<2 <0.25
Endrin		<2 40.25
Endosulfan II		2b 2025
DDD		<pre></pre>
Endrin Aldehyde		< <u>2</u> < 0.23
DDT		<2 <0.25
Endosulfan Sulfate		25.0> d>
Endrin Ketone		<\b < 0.25
Methoxy Chlor		<10 3
Chlordane		<50 ブ
Dibutyl Chlorendate		80
Spike Level		
Vol Sequence	#3&4-08/24/93	
CCI4	<1	
TCA	<1	
Benzene	<1	
TCE	<1	
Toluene	<1	
PCE	<1	
Ethylbenzene	<1	
Xylenes	<2	
Gasoline	<50 乙	
Spike level		
BFB	101	

ANALYTICAL DATA SHEETS FOR QA/QC



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4356-5

Client Sample ID :LAY-AB01 POINT LAY

Matrix

:WATER

WORK Order :70116

Report Completed :10/06/93

Collected :08/24/93 @ 13:46 hrs. Received :08/26/93 @ 12:00 hrs.

5633 B STREET

ANCHORAGE. AK 99518 TEL: (907) 562-2343

FAX: (907) 561-5301

Technical Director: STEPHEN C. EDE Released By: 6.4M

Client Name Ordered By

Project Name

:RAY MORRIS :DEW LINE RI/FS :41096-412-01

:ICF KAISER ENGINEERING

Project# PWSID

:UA

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.0010	U	mg/L	EPA 8260		00/02	00.702	MOM
Bromobenzene	0.0010	Ü	mg/L	EPA 8260			09/02 09/02	MCM
Bromochloromethane	0.0010	Ū	mg/L	EPA 8260			09/02	MCM
Bromodichloromethane	0.0010	Ü	mg/L	EPA 8260			09/02	MCM
Bromoform	0.0010	Ū	mg/L	EPA 8260			09/02	MCM
Bromomethane	0.0010	Ū	mg/L	EPA 8260			09/02	MCM
n-Butylbenzene	0.0010	Ū	mg/L	EPA 8260			09/02	MCM
sec-Butylbenzene	0.0010	Ü	mg/L	EPA 8260				MCM
ert-Butylbenzne	0.0010	ŭ	mg/L	EPA 8260			09/02	MCM
rbon Tetrachloride	0.0010	Ū	mg/L	EPA 8260			09/02	MCM
colorobenzene	0.0010	Ŭ	mg/L	EPA 8260			09/02	MCM
Chloroethane	0.0010	Ü	mg/L	EPA 8260			09/02	MCM
Chloroform	0.0010	ŭ	mg/L	EPA 8260			09/02	HCM
Chloromethane	0.0010	Ü	mg/L	EPA 8260			09/02	MCM
2-Chlorotoluene	0.0010	Ü	mg/L	EPA 8260		09/02	09/02	MCM
4-Chlorotoluene	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
Dibromochloromethane	0.0010	Ü	mg/L	EPA 8260		09/02		. MCM
12Dibromo3Chloropropane	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
1,2-Dibromoethane	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
Dibromomethane	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
1,2-Dichlorobenzene	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
1,3-Dichlorobenzene	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
1,4-Dichlorobenzene	0.0010	ü	mg/L	EPA 8260		09/02		MCM
Dichlorodifluoromethane	0.0010	บ	mg/L			09/02		MCH
1,1-Dichloroethane	0.0010	Ü	mg/L	EPA 8260 EPA 8260		09/02		MCM
1,2-Dichloroethane	0.0010	ŭ	mg/L	EPA 8260		09/02		MCM
1,1-Dichloroethene	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
cis-1,2-Dichloroethene	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
trans1,2-Dichloroethene	0.0010	Ü	ng/L	EPA 8260		09/02		HCM
1,2-Dichloropropane	0.0010	บ	mg/L	EPA 8260		09/02		MCM
1,3-Dichloropropane	0.0010	Ü	mg/L	EPA 8260		09/02		HCM.
2,2-Dichloropropane	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
1,1-Dichloropropene	0.0010	Ü	mg/L			09/02		MCM
Ethylbenzene	0.0010	Ü	mg/L	EPA 8260 EPA 8260		09/02		MCM
Hexachlorobutadiene	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
Isopropylbenzene	0.0010	ti	mg/L	EPA 8260		09/02		MCM
p-Isopropyltoluene	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
	3.0010	U	mg/L	EFA 0200		09/02	09/02	MCM



Chemlab Ref.#

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS :93.4356-5

Client Sample ID :LAY-AB01 POINT LAY

Matrix :WATER

5633 B STREET ANCHORAGE. AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

Methylene Chloride	0.0031		mg/L	EPA 8260	09/02 09/02	MCM
Napthalene	0.0010	Ü	mg/L	EPA 8260	09/02 09/02	MCM
n-Propylbenzene	0.0010	U	mg/L	EPA 8260	09/02 09/02	MCM
Styrene	0.0010	Ū	ng/L	EPA 8260	09/02 09/02	MCM
1112-Tetrachloroethane	0.0010	Ū	mg/L	EPA 8260	09/02 09/02	HCM
1122-Tetrachloroethane	0.0010	Ü	mg/L	EPA 8260	09/02 09/02	MCM
Tetrachloroethene	0.0010	Ü	mg/L	EPA 8260	· · · -	
Toluene	0.0010	Ü	•		09/02 09/02	MCM
1,2,3-Trichlorobenzene		_	mg/L	EPA 8260	09/02 09/02	HCH
1,2,4-Trichlorobenzene	0.0010	U	mg/L	EPA 8260	09/02 09/02	MCM
1,2,4-111CHIOTODENZERE	0.0010	Ü	mg/L	EPA 8260	09/02 09/02	MCM
1,1,1-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/02 09/ 02	MCM
1,1,2-Trichloroethane	0.0010	U	mg/L	EPA 8260	09/02 09/02	MCM
Trichloroethene	0.0010	U	mg/L	EPA 8260	09/02 09/02	MCM
Trichlorofluoromethane	0.0010	U	mg/L	EPA 8260	09/02 09/02	MCM
1,2,3-Trichloropropane	0.0010	U	mg/L	EPA 8260	09/02 09/02	MCM
1,2,4-Trimethylbenzene	0.0010	Ū	mg/L	EPA 8260	09/02 09/02	MCM
1,3,5-Trimethylbenzene	0.0010	Ü	mg/L	EPA 8260	09/02 09/02	MCM
Vinyl Chloride	0.0010	Ü	mg/L	EPA 8260	09/02 09/02	MCM
p+m-Xylene	0.0010	Ü	mg/L	EPA 8260	09/02 09/02	MCM
o-Xylene	0.0010	Ü	-	EPA 8260	09/02 09/02	MCM
	0.0010	U	mg/L	EFA 0200	03/02 03/02	ncn

See Sample Remarks Above

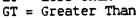
U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed

LT = Less Than





See Special Instructions Above



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4328-2

Client Sample ID :LAY-EB01 POINT LAY

Matrix

:WATER

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343

FAX: (907) 561-5301

Client Name

:ICF KAISER ENGINEERING

Ordered By Project Name

:RAY MORRIS :DEW LINE RI/FS :41096-412-01

Project# PWSID

:UA

WORK Order :70060

Report Completed :09/20/93

Collected :08/23/93 Received

@ 13:45 hr: :08/25/93 @ 12:00 hr:

Technical Director: STEPHEN, C. EDE Released By :

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN.

 Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	In i t
Volatile Organics				EPA 8260				
Benzene	0.0010	IJ	mg/L	EPA 8260		00/02	00.400	
Bromobenzene	0.0010	Ü	mg/L	EPA 8260		09/02	09/02	KWF
Bromochloromethane	0.0010	Ü	mg/L	EPA 8260		09/02	09/02	KWI
Bromodichloromethane	0.0010	Ü	mg/L	EPA 8260		09/02	09/02	KWI
Bromoform	0.0010	บ	mg/L	EPA 8260		09/02	09/02	KWP
Bromomethane	0.0010	Ü	mg/L	EPA 8260		09/02	09/02	KWI
n-Butylbenzene	0.0010	Ü	mg/L	EPA 8260		09/02	09/02	KWE
s ec -Butylbenzene	0.0010	IJ	mg/L	EPA 8260		09/02		KWE
tert-Butylbenzne	0.0010	บ	mg/L	EPA 8260		09/02		KWK.
Carbon Tetrachloride	0.0010	Ü	mg/L	EPA 8260		09/02		KWI.
Chlorobenzene	0.0010	Ü	mg/L	EPA 8260		09/02		KWE
Chloroethane	0.0010	U	mg/L	EPA 8260		09/02		KWK
Chloroform	0.0010	U		EPA 8260		09/02		KWE
Chloromethane	0.0010	Ü	mg/L	EPA 8260		09/02		KWK
2-Chlorotoluene	0.0010	Ü	mg/L	EPA 8260		09/02		KWM
4-Chlorotoluene	0.0010	Ü	mg/L			09/02	09/02	KWH
Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWM
12Dibromo3Chloropropane	0.0010	U	mg/L	EPA 8260		09/02		KWM
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/02		KWM
Dibromomethane	0.0010	U	mg/L	EPA 8260		09/02		KWM
1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02		KWM
1,3-Dichlorobenzene	0.0010	Ü	mg/L	EPA 8260		09/02		KWM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02		KWM
Dichlorodifluoromethane	0.0010	U	mg/L	EPA 8260		09/02		KWM
1,1-Dichloroethane	0.0010	Ü	mg/L	EPA 8260		09/02		KWM
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02		KWH
1,1-Dichloroethene	0.0010	_	mg/L	EPA 8260		09/02		KWM
cis-1,2-Dichloroethene	0.0010	Ü	mg/L	EPA 8260		09/02		KWH
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02		KWM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02		KWH
1,3-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02		KWM
2,2-Dichloropropane		Ü	mg/L	EPA 8260		09/02		KWM
1,1-Dichloropropene	0.0010	Ü	mg/L	EPA 8260		09/02		KWM
Ethylbenzene	0.0010	Ü	mg/L	EPA 8260		09/02		KWH
Hexachlorobutadiene	0.0010	Ü	mg/L	EPA 8260		09/02		KWM
Isopropylbenzene	0.0010	Ü	mg/L	EPA 8260		09/02		KWM
p-Isopropyltoluene	0.0010	U	mg/L	EPA 8260		09/02		KWM
	0.0010	U	mg/L	EPA 8260		09/02	09/02	KWH



ENVIRONMENTAL LABORATORY SERVICES



	REP	ORT of AN	ALYSIS SEC	
Chemlab Ref.# :93.4328-2				5633 8 STREET
Client Sample ID :LAY-EB01	POINT LAY			ANCHORAGE, AK 99518 TEL: (907) 562-2343
Matrix :WATER				FAX: (907) 561-5301
Methylene Chloride	0.0010 U	mg/L	EPA 8260	00/02/00/02
Napthalene	0.0010 U	ng/L	EPA 8260	09/02 09/02 KWI
n-Propylbenzene	0.0010 U	mg/L	EPA 8260	09/02 09/02 KWI
Styrene	0.0010 U			09/02 09/02 KWI
1112-Tetrachloroethane	0.0010 U	mg/L	EPA 8260	09/02 09/02 KWI
1122-Tetrachloroethane	0.0010 U	mg/L	EPA 8260	09/02 09/02 KWI
Tetrachloroethene		mg/L	EPA 8260	09/02 09/02 KWI
Toluene	0.0010 U	mg/L	EPA 8260	09/02 09/ 0 2 KWI
1,2,3-Trichlorobenzene	0.0010 U	mg/L	EPA 8260	09/02 09/02 KWI
1 2 4 Trichlorobenzene	0. 00 10 U	mg/L	EPA 8260	09/02 09/02 KWP
1,2,4-Trichlorobenzene	0 .001 0 U	mg/L	EPA 8260	09/02 09/02 KWP
1,1,1-Trichloroethane	0 .001 0 U	mg/L	EPA 8260	09/02 09/02 KWP
1,1,2-Trichloroethane	0 .001 0 U	mg/L	EPA 8260	09/02 09/02 KWP
Trichloroethene	0 .001 0 U	mg/L	EPA 8260	,
Trichlorofluoromethane	0.0010 ប	mg/L	EPA 8260	
1.2.3-Trichloropropane	0.0010 U	ng/L	EPA 8260	
1,2,4-Trimethylbenzene	0.0010 U	ng/L	EPA 8260	09/02 09/02 KW
1,3,5-Trimethylbenzene	0.0010 U	ng/L	EPA 8260	09/02 09/02 KWH
Vinyl Chloride	0.0010 U	ng/L	EPA 8260	09/02 09/02 KWH
p+m-Xylene	0.0010 U	ng/L	EPA 8260	09/02 09/02 KWH
o-Xylene	0.0010 U	mg/L		09/02 09/02 KWM
	3.0010	mg/ L	EPA 8260	09/02 09/ 02 KWH
Semivolatile Organics			EPA 8270	
Phenol	0.036 ប	mg/L	EPA 8270	00/20 00/20
bis(2-Chloroethyl)ether	0.036 บ			08/28 08/30 hir
2-Chlorophenol	0.036 U	mg/L	EPA 8270	08/28 08/30 MTT
1,3-Dichlorobenzene		mg/L	EPA 8270	08/28 08/30 HTT
1,4-Dichlorobenzene		mg/L	EPA 8270	08/28 08/30 HTT
Benzyl Alcohol	0.036 U	mg/L	EPA 8270	08/28 08/30 MTT
1,2-Dichlorobenzene	0.036 U	mg/L	EPA 8270	08/28 08/30 MTT
2-Methylphenol	0.036 U	mg/L	EPA 8270	08/28 08/30 HTT
bis(2-Chloroisopropyl)e	0.03 6 U	mg/L	EPA 8270	08/28 08/30 HTT
4-Methylphenol	0 .0 36 U	mg/L	EPA 8270	08/28 08/30 MTT
n-Nitroso-di p Brazila-	0. 03 6 U	mg/L	EPA 8270	08/28 08/30 MTT
n-Nitroso-di-n-Propylam Hexachloroethane	0 .03 6 U	mg/L	EPA 8270	08/28 08/30 HTT
Nitrobenzene	0 .03 6 U	mg/L	EPA 8270	08/28 08/30 HTT
Isophorone	0.036 U	mg/L	EPA 8270	08/28 08/30 HTT
2 Mitanhama	០ .03 6 ប	mg/L	EPA 8270	08/28 08/30 MTT
2-Nitrophenol	0.036 U	mg/L	EPA 8270	08/28 08/30 HTT
2,4-Dimethylphenol	0.036 U	mg/L	EPA 8270	08/28 08/30 MTT
Benzoic Acid	0.036 U	mg/L	EPA 8270	08/28 08/30 MTT
bis(2-Chloroethoxy)Meth	0.036 U	mg/L	EPA 8270	08/28 08/30 MTT
2.4-Dichlorophenol	0. 03 6 U	mg/L	EPA 8270	08/28 08/30 HTT
1,2,4-Trichlorobenzene	0.036 U	mg/L	EPA 8270	08/28 08/30 HTT
Naphthalene	0.036 ប	mg/L	EPA 8270	08/28 08/30 HTT
4-Chloroaniline	0 .03 6 ប	mg/L	EPA 8270	08/28 08/30 MTT
Hexachlorobutadiene	0.036 U	mg/L	EPA 8270	08/28 08/30 MTT
4-Chloro-3-Methylphenol	0.03 6 U	mg/L	EPA 8270	08/28 08/30 HTT
2-Methylnaphthalene	0.036 U	ng/L	EPA 8270	08/28 08/30 HTT
Hexachlorocyclopentadie	0.036 U	mg/L	EPA 8270	08/28 08/30 MTT
2,4,6-Trichlorophenol	0. 03 6 U	mg/L	EPA 8270	
2,4,5-Trichlorophenol	0.036 U	mg/L	EPA 8270	08/28 08/30 HTT 08/28 08/30
2-Chloronaphthalene	0.036 U	mg/L	EPA 8270	08/28 08/30 T
		⊒/ ₩		00/20 00/30



ENVIRONMENTAL LABORATORY SERVICES

* No. 2.2 (1949)	מייני	OD7 - C 11				
-Chemlab Ref.# :93.4328-2		ORT OF AN	VALYSIS X		56 33 B 5	STOCET
Client Sample ID :[AY_FRO1	POINT LAY				ANCHORAGE, A	K 99518
Matrix :WATER					TEL: (907) 5	62-2343
2 1111					FAX: (907) 5	61-5301
2-Nitroaniline	0.036 ប	mg/L	EPA 8270		22.42	
Dimethylphthalate	0.036 U	mg/L	EPA 8270		08/28 08/30	HT
Acenaphthylene	0.036 U	mg/L	EPA 8270		08/28 08/30	HT
2,6-Dinitrotoluene	0.036 U	mg/L			08/28 08/30	HT
3-Nitroaniline	0.036 U	mg/L	EPA 8270		08/28 08/30	HT
Acenaphthene	0.036 U	ng/L	EPA 8270		08/28 08/30	MT
2.4-Dinitrophenol	0.036 U	mg/L	EPA 8270 EPA 8270		08/28 08/30	HT
4-Nitrophenol	0.036 U	mg/L	EPA 8270		08/28 08/30	MIT
Dibenzofuran	0.03 6 U	mg/L			08/28 08/30	MT.
2.4-Dinitrotoluene	0.036 U	ng/L	EPA 8270		08/28 08/30	MI
Diethylphthalate	0.036 U	mg/L	EPA 8270		08/28 08/30	MT
4-Chlorophenyl-Phenylet	0.036 U	mg/L	EPA 8270		08/28 08/30	HTI
r Tuorene	0.036 ປ	mg/L	EPA 8270		08/28 08/30	HTI
4-Nitroaniline	0.036 U		EPA 8270		08/28 08/30	MII
4,6-Dinitro-2-Methylphe	0.036 U	ing/L	EPA 8270		08/28 08/30	HIT
n-Nitrosodiphenvlamine	0 .036 บ	mg/L	EPA 8270		08/28 08/30	MTI
4-Bromophenyl-Phenyleth	0.036 U	mg/L mg/L	EPA 8270		08/28 08/30	HTT
Hexachlorobenzene	0.036 U		EPA 8270		08/28 08/30	HII
Pentachlorophenol	0.036 U	mg/L	EPA 8270		08/28 08/30	HTT
Phenanthrene	0.03 6 ປ	mg/L	EPA 8270		08/28 08/30	HTI
Anthracene	0.036 U	ng/L	EPA 8270		08/28 08/30	MTT
di-n-Butylphthalate	0.036 U	mg/L	EPA 8270		08/28 08/30	MIT
Fluoranthene	0.036 U	mg/L	EPA 8270		08/28 08/30	MTT
Pyrene	0.036 U	mg/L mg/L	EPA 8270		08/28 08/30	MIT
Butylbenzylphthalate	0.036 U	mg/L	EPA 8270		08/28 08/30	MIT
3,3-Dichlorobenzidine	0.036 U	ng/L	EPA 8270		08/28 08/30	HTT
Benzo(a)Anthracene	0.03 6 ป	mg/L	EPA 8270		08/28 08/30	HTT
Chrysene	0.036 บั	ng/L	EPA 8270		08/28 08/30	HTT
bis(2-Ethylhexyl)Phthal	0.036 U	mg/L	EPA 8270		08/28 08/30	HTT
di-n-Octylphthalate	0.036 U	mg/L	EPA 8270		08/28 08/30	HTT
Benzo(b)Fluoranthene	0.036 U	mg/L	EPA 8270		08/28 08/30	HTT
Benzo(k)Fluoranthene	0.036 U		EPA 8270		08/28 08/30	MTT
Benzo(a)Pyrene	0. 036 ປ	mg/L	EPA 8270		08/28 08/30	MTT
Indeno(1,2,3-cd)Pyrene	0.036 U	mg/L mg/L	EPA 8270		08/28 08/30	MTT
Dibenz(a,h)Anthracene	0.036 U	mg/L	EPA 8270		08/28 08/30	HTT
Benzo(g,h,i)Perylene	0.036 U	mg/L	EPA 8270		08/28 08/30	MTT
	33333	mg/ L	EPA 8270		08/28 08/3 0	MTT
Total Metals Analysis			_			
ICP Screen, ICF			EPA	- 1-		
Aluminum	0.10 U	mg/L	EPA 6010	n/a	00 (00 00 10 1	
Antimony	0.10 U	mg/L	EPA 6010		09/02 09/06	DLG
Arsenic	0.10 U	mg/L	EPA 6010		09/02 09/06	DLG
Barium	0 .050 U	mg/L	EPA 6010		09/02 09/06	DLG
Beryllium	0.050 U	mg/L	EPA 6010		09/02 09/06	DLG
Cadmium	0.050 U	mg/L	EPA 6010		09/02 09/06	DLG
Calcium	0.20 บ	mg/L	EPA 6010		09/02 09/06	DLG
Chromium	0.050 U	mg/L	EPA 6010		09/02 09/06	DLG
Cobalt	0.10 U	mg/L	EPA 6010		09/02 09/06	DLG
Copper	0.050 U	mg/L	EPA 6010		09/02 09/06	DLG
Iron	0.10 U	mg/L	EPA 6010		09/02 09/06	DLG
Lead	0.10 U	mg/L	EPA 6010		09/02 09/06	DLG
			PLY OOTO		09/02 09/06	DLG





ENVIRONMENTAL LABORATORY SERVICES

3.75 J. t 30W				n - C AVIATIV	/	NC -			
Chemlab Ref.# Client Sample ID Matrix	:93.4328-2 :LAY-EB01 PC :WATER	I YAJ TNIC	Challe 1000	r of ANALYS	515 <i>)</i>		Т	5633 B STI ORAGE, AK 9 EL: (907) 562 AX: (907) 561	99518 -2343
Magnesium		0.20			m s	6010	09/02	00/06	D.
Manganese		0.20 0.050	U U	mg/L		6010 6010	09/02 09/02		DŁ DŁ
Molybdenum			-	mg/L			•	•	_
		0.050	Ü	mg/L		6010	09/02		DC
Nickel		0.050	U	mg/L		6010	09/02	•	DL
Potassium		5.0	Ü	mg/L	EPA	6010	09/02	09/06	DL
Selenium		0.10	U	ng/L	EPA	6010	09/02	09/06	DL
Silver		0.050	υJ	mg/LJ.(EPA	6010	09/02	09/06	DL
Sodium		0.25	Ü	mg/L	EPA	6010	09/15	09/17	DE
Thallium		0.0050	U	mg/L	EPA	7841	09/02	09/03	KA.
Van adium		0.050	U	mg/L	EPA	6010	09/02	09/06	DL
Zinc		0.050	U	mg/L	EPA	6010	09/15	09/17	DF1

All charges s. L 2/2/94

* See Special Instructions Above

** See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable
NA = Not Analyze

LT = Less Than

GT = Greater Than



Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4328-3

Client Sample ID :LAY-EB01 POINT LAY SPIKE

Matrix

:WATER

:ICF KAISER ENGINEERING

Client Name Ordered By

:RAY MORRIS

Project Name Project#

:DEW LINE RI/FS :41096-412-01

PWSID

:UA

WORK Order

:70060 Report Completed :09/20/93

Collected

:08/23/93 @ 13:45 hr:

Received

:08/25/93 @ 12:00 hr:

5633 B STREET

ANCHORAGE, AK 99518 TEL: (907) 562-2343

FAX (907) 561-5301

Technical Director: STEPHEN C. EDE Released By : September 2

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN. FOR SPIKE AND

SPIKE DUPLICATE RECOVERIES, SEE QC PACKAGE.

Semivolatile Organics	 Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
District District	Phenol		· — — ·	mg/L			08/28	08/30	мл и т
2-Chloropenol 1,3-Dichlorobenzene 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1,4-Dichlorobenzene 0.173 mg/L EPA 8270 08/28 08/30 MTT Benzyl Alcohol 1,2-Dichlorobenzene 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2-Methylphenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2-Methylphenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2-Methylphenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2-Methylphenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2-Methylphenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2-Methylphenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2-Methylphenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2-Mitroso-di-n-Propylam 0.214 mg/L EPA 8270 08/28 08/30 MTT Nitrobenzene 0.036 U mg/L EPA 8270 08/28 08/30 MTT Nitrobenzene 0.036 U mg/L EPA 8270 08/28 08/30 MTT Sophorone 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2-Mitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2-Mitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 3-Mitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 3-Mitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 3-Mitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 3-Mitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 3-Mitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 3-Mitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 0-Mitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 0-Mitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 0-Mitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 0-Mitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 0-Mitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 0-Mitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 0-Mitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 0-Mitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 0-Mitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 0-Mitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 0-Mitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 0-Mitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 0-Mitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 0-Mitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 0-Mitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 0-Mitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 0-Mitrophenol 0.	bis(2-Chloroethyl)ether		U						
1,4-Dichlorobenzene	2-Chlorophenol	_							
National Content National Co	1,3-Dichiorobenzene	_	U						
Benzyl Acohol				mg/L					
1,2-D1chlorobenzene			U						
nethylphenol			U	mg/L					
Dist/2-Intoroisopropy() 0.036 U mg/L EPA 8270 08/28 08/30 HTT			U	mg/L					
## a-nettylpnehol	Dis(2-Chioroisopropyl)e		U	mg/L					
Hexachloroethane	4-nethylphenol		U	mg/L					
Nitrobenzene 0.036 U mg/L EPA 8270 08/28 08/30 MTT Isophorone 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2-Nitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2-Nitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2,4-Dimethylphenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 5 08/28 08/30 MTT 0.036 U mg/L EPA 8270 08/28 08/30 MTT 0.036 U mg/L EPA 82	n-Nitroso-di-n-Propylam			mg/L	EPA 8270				
National Color			Ü	mg/L	EPA 8270	•			
Solution			_	mg/L	EPA 8270				
2.4-Dimethylphenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2.4-Dimethylphenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT bis(2-Chloroethoxy)Meth 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2.4-Dichlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.2.4-Trichlorobenzene 0.198 mg/L EPA 8270 08/28 08/30 MTT 1.2.4-Trichlorobenzene 0.198 mg/L EPA 8270 08/28 08/30 MTT A-Chloroaniline 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.2.4-Chloroaniline 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.2.4-Chloroaniline 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.2.4-Chloroaniline 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.2.4-Chloroaniline 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.2.4-Chloroaniline 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.2.4-Chloroaniline 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.2.4-Chlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.2.4-Chlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.2.4-Chlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.2.4-Chlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.2.4-Chlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.2.4-Chlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.2.4-Chlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.3.4-Chlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.3.4-Chlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.3.4-Chlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.3.4-Chlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.3.4-Chlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.3.4-Chlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.3.4-Chlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.3.4-Chlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.3.4-Chlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.3.4-Chlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.3.4-Chlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.3.4-Chlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.3.4-Chlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.3.4-Chlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.3.4-Chlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 1.3.4-Chlorophenol 0.036 U mg/L EPA 827			_	mg/L	EPA 8270				
Benzoic Acid 0.036 U mg/L EPA 8270 08/28 08/30 MTT 0.036 U mg/L EPA 82			_	mg/L	EPA 8270		08/28	08/30	
bis(2-Chloroethoxy)Meth				mg/L	EPA 8270		08/28	08/30	
District District			_	mg/L	EPA 8270				
1,2,4-Trichlorobenzene	2 4 Dishloroetnoxy) meth		_						
Naphthalene 0.036 U mg/L EPA 8270 08/28 08/30 MTT 4-Chloroaniline 0.036 U mg/L EPA 8270 08/28 08/30 MTT Hexachlorobutadiene 0.036 U mg/L EPA 8270 08/28 08/30 MTT 4-Chloro-3-Methylphenol 0.194 mg/L EPA 8270 08/28 08/30 MTT 2-Methylnaphthalene 0.036 U mg/L EPA 8270 08/28 08/30 MTT Hexachlorocyclopentadie 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2,4,6-Trichlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2,4,5-Trichlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2-Nitroaniline 0.036 U mg/L EPA 8270 08/28 08/30 MTT Dimethylphthalate 0.036 U mg/L EPA 8270 08/28 08/30 MTT Acenaphthylene 0.036 U mg/L EPA 8270 08/28 08/30 MTT 3-Nitroaniline 0.036 U mg/L EPA 8270 08/28 08/30 MTT Acenaphthene 0.036 U mg/L EPA 8270 08/28 08/30 MTT Acenaphthene 0.036 U mg/L EPA 8270 08/28 08/30 MTT A-Dipitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT <	1 2 4 Trichlorophenoi		U						
4-Chloroaniline	Vanhthalene						08/28	08/30	MTT
Hexachlorobutadiene 0.036 U mg/L EPA 8270 08/28 08/30 HTT 4-Chloro-3-Methylphenol 0.194 mg/L EPA 8270 08/28 08/30 HTT 2-Methylnaphthalene 0.036 U mg/L EPA 8270 08/28 08/30 HTT Hexachlorocyclopentadie 0.036 U mg/L EPA 8270 08/28 08/30 HTT 2,4,6-Trichlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 HTT 2,4,5-Trichlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 HTT 2-Chloronaphthalene 0.036 U mg/L EPA 8270 08/28 08/30 HTT 2-Nitroaniline 0.036 U mg/L EPA 8270 08/28 08/30 HTT Acenaphthylene 0.036 U mg/L EPA 8270 08/28 08/30 HTT 2,6-Dinitrotoluene 0.036 U mg/L EPA 8270 08/28 08/30 HTT Acenaphthene 0.036 U mg/L EPA 8270 08/28 08/30 HTT 2,4-Dinitrophenol 0.036 U mg			_				08/28	08/30	
4-Chloro-3-Methylphenol 0.194 mg/L EPA 8270 08/28 08/30 MTT 2-Methylnaphthalene 0.036 U mg/L EPA 8270 08/28 08/30 MTT Hexachlorocyclopentadie 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2,4,6-Trichlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2,4,5-Trichlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2-Chloronaphthalene 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2-Nitroaniline 0.036 U mg/L EPA 8270 08/28 08/30 MTT Dimethylphthalate 0.036 U mg/L EPA 8270 08/28 08/30 MTT 0.036 U mg/L EPA 8270			_						MTT
2-Methylnaphthalene 0.036 U mg/L EPA 8270 08/28 08/30 MTT 0.036 U mg/L			U						MTT
Hexachlorocyclopentadie 0.036 U mg/L EPA 8270 08/28 08/30 HTT 2,4,6-Trichlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 HTT 2,4,5-Trichlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 HTT 2-Chloronaphthalene 0.036 U mg/L EPA 8270 08/28 08/30 HTT 2-Nitroaniline 0.036 U mg/L EPA 8270 08/28 08/30 HTT Dimethylphthalate 0.036 U mg/L EPA 8270 08/28 08/30 HTT Acenaphthylene 0.036 U mg/L EPA 8270 08/28 08/30 HTT 2,6-Dinitrotoluene 0.036 U mg/L EPA 8270 08/28 08/30 HTT 3-Nitroaniline 0.036 U mg/L EPA 8270 08/28 08/30 HTT 3-Nitroaniline 0.036 U mg/L EPA 8270 08/28 08/30 HTT Acenaphthene 0.209 mg/L EPA 8270 08/28 08/30 HTT Acenaphthene 0.209 mg/L EPA 8270 08/28 08/30 HTT 0.209 mg/L EPA 8270 08/28 08/20 MTT 0.209 mg/L EPA 8270 08/28 08/20 MTT 0.209 mg/L EPA 8270 08/28 08/20 MTT 0.209 mg/L EPA	7-Methylpanhthalene								MTT
2,4,6-Trichlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2,4,5-Trichlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2-Chloronaphthalene 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2-Nitroaniline 0.036 U mg/L EPA 8270 08/28 08/30 MTT Dimethylphthalate 0.036 U mg/L EPA 8270 08/28 08/30 MTT Acenaphthylene 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2,6-Dinitrotoluene 0.036 U mg/L EPA 8270 08/28 08/30 MTT 3-Nitroaniline 0.036 U mg/L EPA 8270 08/28 08/30 MTT 3-Nitroaniline 0.036 U mg/L EPA 8270 08/28 08/30 MTT Acenaphthene 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT	Heyachlorocyclopentadio								MTT
2,4,5-Trichlorophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2-Chloronaphthalene 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2-Nitroaniline 0.036 U mg/L EPA 8270 08/28 08/30 MTT Dimethylphthalate 0.036 U mg/L EPA 8270 08/28 08/30 MTT Acenaphthylene 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2,6-Dinitrotoluene 0.036 U mg/L EPA 8270 08/28 08/30 MTT 3-Nitroaniline 0.036 U mg/L EPA 8270 08/28 08/30 MTT Acenaphthene 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.209 mg/L EPA 8270 08/28 08/30 MTT			_						MTT
2-Chloronaphthalene 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2-Nitroaniline 0.036 U mg/L EPA 8270 08/28 08/30 MTT Dimethylphthalate 0.036 U mg/L EPA 8270 08/28 08/30 MTT Acenaphthylene 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2,6-Dinitrotoluene 0.036 U mg/L EPA 8270 08/28 08/30 MTT 3-Nitroaniline 0.036 U mg/L EPA 8270 08/28 08/30 MTT Acenaphthene 0.036 U mg/L EPA 8270 08/28 08/30 MTT Acenaphthene 0.209 mg/L EPA 8270 08/28 08/30 MTT 2.4-Dinitrophenol			_						MTT
2-Nitroaniline 0.036 U mg/L EPA 8270 08/28 08/30 MTT Dimethylphthalate 0.036 U mg/L EPA 8270 08/28 08/30 MTT Acenaphthylene 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2,6-Dinitrotoluene 0.036 U mg/L EPA 8270 08/28 08/30 MTT 3-Nitroaniline 0.036 U mg/L EPA 8270 08/28 08/30 MTT Acenaphthene 0.209 mg/L EPA 8270 08/28 08/30 MTT 2,4-Dinitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2,4-Dinitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT	2-Chloropaphthalene		-						MTT
Dimethylphthalate 0.036 U mg/L EPA 8270 08/28 08/30 MTT Acenaphthylene 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2,6-Dinitrotoluene 0.036 U mg/L EPA 8270 08/28 08/30 MTT 3-Nitroaniline 0.036 U mg/L EPA 8270 08/28 08/30 MTT Acenaphthene 0.209 mg/L EPA 8270 08/28 08/30 MTT 0.204 0.205 08/28 08/30 MTT 0.204 0.205 08/28 08/30 MTT 0.204 0.205 08/28 08/30 MTT 0.204 0.205 08/28 08/30 MTT 0.204 0.205 08/28 08/30 MTT 0.204 0.205 08/28 08/30 MTT 0.204 0.205 08/28 08/30 MTT 0.204 0.205 08/28 08/30 MTT 0.204 0.205 08/28 08/30 MTT 0.204 0.205 08/28 08/30 MTT 0.204 08/28 08			-	_					
Acenaphthylene 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2,6-Dinitrotoluene 0.036 U mg/L EPA 8270 08/28 08/30 MTT 3-Nitroaniline 0.036 U mg/L EPA 8270 08/28 08/30 MTT Acenaphthene 0.209 mg/L EPA 8270 08/28 08/30 MTT 2,4-Dinitrophenol 0.036 U mg/L EPA 8270 08/28 08/30 MTT 2,4-Dinitrophenol			_	-					
2,6-Dinitrotoluene 0.036 U mg/L EPA 8270 08/28 08/30 MTT 3-Nitroaniline 0.036 U mg/L EPA 8270 08/28 08/30 MTT Acenaphthene 0.209 mg/L EPA 8270 08/28 08/30 MTT 2.4-Dinitrophenol 0.209 mg/L EPA 8270 08/28 08/30 MTT			-						
3-Nitroaniline 0.036 U mg/L EPA 8270 08/28 08/30 MTT Acenaphthene 0.209 mg/L EPA 8270 08/28 08/30 MTT 2.4-Dipitrophenol 0.36 U mg/L EPA 8270 08/28 08/30 MTT			-						
Acenaphthene 0.209 mg/L EPA 8270 08/28 08/30 MTT 2.4-Dipitrophenol 0.306 H EPA 8270 08/28 08/30 MTT			_						
2.4-Dinitrophenol 0.036 H			U						
0.030 0 mg/L EPA 82/0 08/28 08/30 MTT			11						
	,	0.036	U	mg/L	EPA 82/0		08/28	08/30	MTT





Chemlab Ref.#

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

REPORT OF ANALYSIS SEE :93.4328-3

Client Sample ID :LAY-EB01 POINT LAY SPIKE

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343

Matrix	:WATER					i	FAX: (907) 5	61-5301
4-Nitropheno Dibenzofurar 2,4-Dinitros Diethylphtha 4-Chloropher Fluorene 4-Nitroanili 4,6-Dinitro- n-Nitrosodir	ol n toluene alate nyl-Phenylet lne -2-Methylphe chenylamine vl-Phenyleth enzene chenol dithalate chthalate benzidine racene exyl)Phthal thalate ranthene ranthene ne -cd)Pyrene nthracene	0.129 0.036	מממממממממ מ מם מממממממ מ	#9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L	8270 8270 8270 8270 8270 8270 8270 8270	08/28 08/28 08/28 08/28 08/28 08/28 08/28 08/28 08/28 08/28 08/28	08/30 08/30	HT HT HT HT HT HT HT HT HT HT HT HT HT H

See Special Instructions Above

** See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed

LT = Less Than GT = Greater Than



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ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4328-4 Client Sample ID :LAY-EB01 POINT LAY SPIKE DUPLICATE

Matrix :WATER

Client Name :ICF KAISER ENGINEERING

Ordered By :RAY MORRIS Project Name :DEW LINE RI/FS Project# :41096-412-01

PWSID

:UA

WORK Order :70060 Report Completed :09/20/93

Collected :08/23/93 @ 13:45 hrs Received :08/25/93 @ 12:00 hrs

5633 B STREET ANCHORAGE, AK 99518

EL: (907) 562-2343 FAX (907) 561-5301

Technical Director: STEPHEN C. EDE
Released By: Stylen out

Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN. FOR SPIKE AND SPIKE DUPLICATE RECOVERIES, SEE QC PACKAGE.

Parameter	Results	QC Qual	Units	Meth⊙d	Allowable Limits	Ext. Date	Anal Date	Init
Semivolatile Organics				EPA 8270				
Phenol	0.186		mg/L	EPA 8270		08/28	08/30	MTT
bis(2-Chloroethyl)ethe		U	mg/L	EPA 8270			08/30	MTT
2-Chlorophenol	0.239		mg/L	EPA 8270		08/28	08/30	MIT
1,3-Dichlorobenzene	0.040	U	mg/L	EPA 8270		08/28	08/30	MTI
1,4-Dichlorobenzene	0.268		mg/L	EPA 8270			08/30	MTT
Benzyl Alcohol	0.044	U	mg/L	EPA 8270		08/28	08/30	HIT
1,2-Dichlorobenzene	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
2-Methylphenol	0.044	U	mg/L	EPA 8270			08/30	MTT
bis(2-Chloroisopropyl)		U	mg/L	EPA 8270			08/30	HTT
4-Methylphenol	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
n-Nitroso-di-n-Propyla			mg/L	EPA 8270			08/30	MTT
Hexachloroethane	0.044	U	mg/L	EPA 8270			08/30	MTI
Nitrobenzene	0.044	U	mg/L	EPA 8270		08/28	08/30	HTT
Isophorone	0.044	U	mg/L	EPA 8270			08/30	MTT
2-Nitrophenol	0.044	U	mg/L	EPA 8270			08/30	MTT
2,4-Dimethylphenol	0.044	U	mg/L	EPA 8270			08/30	MTT
Benzoic Acid	0.044	U	mg/L	EPA 8270	•		08/30	MTT
bis(2-Chloroethoxy)Met		Ü	mg/L	EPA 8270			08/30	MTT
2,4-Dichlorophenol	0.044	Ū	mg/L	EPA 8270		08/28	08/30	MTT
1,2,4-Trichlorobenzene	0.295		mg/L	EPA 8270			08/30	MTT
Naphthalene	0.044	U	mg/L	EPA 8270			08/30	MTT
4-Chloroaniline	0.044	U	mg/L	EPA 8270		08/28		MTT
Hexachlorobutadiene	0.044	U	mg/L	EPA 8270			08/30	MTT
4-Chloro-3-Methylpheno			mg/L	EPA 8270	•		08/30	MTT
2-Methylnaphthalene	0.044	ប	mg/L	EPA 8270		08/28	08/30	MTT
Hexachlorocyclopentadi		Ü	mg/L	EPA 8270		08/28	08/30	MTT
2,4,6-Trichlorophenol	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
2,4,5-Trichlorophenol	0.044	U ·	mg/L	EPA 8270		08/28	08/30	MTT
2-Chloronaphthalene	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
2-Nitroaniline	0.044	U	mg/L	EPA 8270		08/28	08/30	MTT
Dimethylphthalate	0.044	U	mg/L	EPA 8270		08/28		MTT
Acenaphthylene	0.044	Ü	mg/L	EPA 8270		08/28		HTT
2,6-Dinitrotoluene	0.044	U	mg/L	EPA 8270		08/28		MTT
3-Nitroaniline	0.044	U	mg/L	EPA 8270		08/28		MTT
Acenaphthene	0.308		mg/L	EPA 8270		08/28		MTT
2,4-Dinitrophenol	0.044	Ü	mg/L	EPA 8270		08/28		MTT



ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.# :93.4328-4

Client Sample ID :LAY-EB01 POINT LAY SPIKE DUPLICATE

ANCHORAGE, AK 99518 TEL. (907) 562-2343

Matrix :WATER	PUINI LAY	,	PIKE DUPLI	CATE	FAX: (907) 562-2343
4-Nitrophenol	0.142		₽G (T	FD 10270	00/20 00/20
Dibenzofuran	0.044	U	mg/L	EPA 8270	08/28 08/30 MT
2,4-Dinitrotoluene	0.301	U	mg/L	EPA 8270	08/28 08/30 MT
Diethylphthalate	0.044	U	mg/L	EPA 8270	08/28 08/30 MT
4-Chlorophenyl-Phenylet	0.044	Ü	mg/L	EPA 8270	08/28 08/30 HT
Fluorene	0.044	Ü	mg/L	EPA 8270	08/28 08/30 MT
4-Nitroaniline	0.044	Ü	mg/L mg/L	EPA 8270 EPA 8270	08/28 08/30 HT
4,6-Dinitro-2-Methylphe	0.044	Ü	mg/L	EPA 8270	08/28 08/30 MT 08/28 08/30 MT
n-Nitrosodiphenylamine	0.044	Ü	mg/L	EPA 8270	
4-Bromophenyl-Phenyleth	0.044	ü	ng/L	EPA 8270	
Hexachlorobenzene	0.044	U	mg/L	EPA 8270	08/28 08/30 MT 08/28 08/30 MT
Pentachlorophenol	0.162	0	mg/L	EPA 8270	
Phenanthrene	0.044	U	mg/L	EPA 8270	
Anthracene	0.044	Ü	mg/L	EPA 8270	
di-n-Butylphthalate	0.309	0	mg/L	EPA 8270	
Fluoranthene	0.044	U	ng/L	EPA 8270	
Pyrene	0.311	Ų	mg/L	EPA 8270	
Butylbenzylphthalate	0.044	U	mg/L	EPA 8270	08/28 08/30 MT 08/28 08/30 MT
3,3-Dichlorobenzidine	0.044	U	mg/L	EPA 8270	
Benzo(a)Anthracene	0.044	Ü	mg/L	EPA 8270	08/28 08/30 MT 08/28 08/30 MT
Chrysene	0.044	Ü	mg/L	EPA 8270	08/28 08/30 MT
bis(2-Ethylhexyl)Phthal	0.044	Ü	mg/L	EPA 8270	08/28 08/30 HT
di-n-Octylphthalate	0.044	Ū	mg/L	EPA 8270	08/28 08/30 TT
Benzo(b)Fluoranthene	0.044	U	mq/L	EPA 8270	08/28 08/30 AT
Benzo(k)Fluoranthene	0.044	U	mg/L	EPA 8270	08/28 08/30 HT.
Benzo(a)Pyrene	0.044	U	mg/L	EPA 8270	08/28 08/30 MT
Indeno(1,2,3-cd)Pyrene	0.044	U	mg/L	EPA 8270	08/28 08/30 MT
Dibenz(a,h)Anthracene	0.044	U	mg/L	EPA 8270	08/28 08/30 MT
Benzo(g,h,i)Perylene	0.044	U	mg/L	EPA 8270	08/28 08/30 MTI

See Special Instructions Above

** See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable

NA = Not AnalyzeLT = Less Than

GT = Greater Than



SGS Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4356-2

Client Sample ID :LAY-EB02 POINT LAY

Matrix

:WATER

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343

FAX: (907) 561-5301

Client Name

:ICF KAISER ENGINEERING

Ordered By Project Name

:RAY MORRIS :DEW LINE RI/FS

Project#

:41096-412-01

PWSID :UA WORK Order :70116

Report Completed :10/06/93

Collected :08/24/93 @ 13:50 hrs. Received :08/26/93 @ 12:00 hrs.

Technical Director: STEPHEN EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON. 8270: SURROGATE RECOVERY IS BELOW QC LIMITS FOR NITROBENZENE-D5 AND 2-FLUOROBIPHENYL.

00

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	In it
Volatile Organics				EPA 8260				
Benzene	0.0010	U	mg/L	EPA 8260		00 (00	00.400	
Bromobenzene	0.0010	Ü	mg/L	EPA 8260		09/02	09/02	MCM
Bromochloromethane	0.0010	Ü	mg/L				09/02	MCM
Bromodichloromethane	0.0010	บ	mg/L	EPA 8260			09/02	MCM
Bromoform	0.0010	บ	mg/L	EPA 8260		09/02	09/02	MCM
Bromomethane	0.0010	Ü	mg/L	EPA 8260		09/02	09/02	MCM
n-Butylbenzene	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
ec-Butylbenzene	0.0010	Ü	mg/L	EPA 8260		09/02	09/02	HCM
rt-Butylbenzne	0.0010	ŭ	mg/L	EPA 8260		09/02		MCM
tarbon Tetrachloride	0.0010	Ü	mg/L	EPA 8260		09/02		HCM
Chlorobenzene	0.0010	U	mg/L	EPA 8260		09/02		MCM
Chloroethane	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
Chloroform	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
Chloromethane	0.0010	Ü		EPA 8260		09/02		MCM
2-Chlorotoluene	0.0010	Ü	mg/L	EPA 8260		09/02	09/02	MCM
4-Chlorotoluene	0.0010	Ü	mg/L	EPA 8260			09/02	
Dibromochloromethane	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
12Dibromo3Chloropropane	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
1,2-Dibromoethane	0.0010	Ü	mg/L	EPA 8260		09/02	09/02	MCM
Dibromomethane	0.0010	บ	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichlorobenzene	0.0010	บ	mg/L	EPA 8260		09/02	09/02	MCM
1,3-Dichlorobenzene	0.0010	Ü	mg/L	EPA 8260		09/02		HCM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02		MCM
Dichlorodifluoromethane	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
1,1-Dichloroethane	0.0010	_	mg/L	EPA 8260		09/02		MCM
1,2-Dichloroethane	0.0010	U U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloroethene	0.0010	_	mg/L	EPA 8260		09/02		MCM
cis-1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
trans1,2-Dichloroethene	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
1,2-Dichloropropane	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
1,3-Dichloropropane	_	U	mg/L	EPA 8260		09/02		MCM
2,2-Dichloropropane	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
1,1-Dichloropropene	0.0010	Ü	mg/L	EPA 8260		09/02	09/02	MCM
Ethylbenzene	0.0010 0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Hexachlorobutadiene	0.0010	U	mg/L	EPA 8260		09/02		MCM
Isopropylbenzene	0.0010	U	mg/L	EPA 8260		09/02		MCM
	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM



REPORT of ANALYSIS

ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.# :93.4356-2 5633 B STREET Client Sample ID :LAY-EB02 POINT LAY ANCHORAGE, AK 99518 Matrix TEL: (907) 562-2343 :WATER FAX: (907) 561-5301 p-Isopropyltoluene 0.0010 mg/L EPA 8260 09/02 09/02 MCM Methylene Chloride 0.0023 mg/L EPA 8260 09/02 09/02 MCM Napthalene 0.0010 U mg/L **EPA** 8260 09/02 09/02 MCM n-Propylbenzene 0.0010 Ü mg/L EPA 8260 09/02 09/02 MCM Styrene 0.0010 U EPA 8260 mq/L 09/02 09/02 MCM 1112-Tetrachloroethane 0.0010 U mg/L EPA 8260 09/02 09/02 MCM 1122-Tetrachloroethane 0.0010 mg/L EPA 8260 09/02 09/02 MCM Tetrachloroethene 0.0010 U mg/L EPA 8260 09/02 09/02 MCM Toluene 0.0010 u mg/L **EPA** 8260 09/02 09/02 MCM 1,2,3-Trichlorobenzene 0.0010 U mq/L EPA 8260 09/02 09/02 1.2.4-Trichlorobenzene MCM 0.0010 U mq/L EPA 8260 09/02 09/02 MCM 1,1,1-Trichloroethane 0.0010 U mg/L EPA 8260 09/02 09/02 MCM 1,1,2-Trichloroethane 0.0010 mg/L **EPA** 8260 09/02 09/02 MCM Trichloroethene 0.0010 U mg/L EPA 8260 09/02 09/02 Trichlorofluoromethane MCM 0.0010 U mg/L EPA 8260 09/02 09/02 1.2.3-Trichloropropane MCM 0.0010 11 EPA 8260 mq/L 09/02 09/02 MCM 1,2,4-Trimethylbenzene 0.0010 EPA 8260 mg/L 09/02 09/02 MCM 1,3,5-Trimethylbenzene 0.0010 U mg/L **EPA** 8260 09/02 09/02 MCM Vinyl Chloride 0.0010 11 mg/L EPA 8260 09/02 09/02 MCM p+m-Xylene 0.0010 U mg/L EPA 8260 09/02 09/02 MCM o-Xylene 0.0010 U mg/L **EPA** 8260 09/02 09/02 MCM Semivolatile Organics **EPA** 8270 Phenol 0.025 U EPA 8270 mg/L 08/30 09/06 MTT bis(2-Chloroethyl)ether 0.025 U mg/L EPA 8270 08/30 09/06 MTT 2-Chlorophenol 0.025 U mg/L **EPA** 8270 08/30 09/06 MTT 1,3-Dichlorobenzene 0.025 U mg/L EPA 8270 08/30 09/06 MTT 1,4-Dichlorobenzene 0.025 IJ mg/L **EPA** 8270 08/30 09/06 MTT Benzyl Alcohol 0.025 H mg/L **EPA** 8270 08/30 09/06 MTT 1,2-Dichlorobenzene 0.025 U mg/L EPA 8270 08/30 09/06 MTT 2-Methylphenol 0.025 U mg/L EPA 8270 08/30 09/06 MTT bis(2-Chloroisopropyl)e 0.025 U mq/L EPA 8270 08/30 09/06 MIT 4-Methylphenol 0.025 U mq/L **EPA** 8270 08/30 09/06 MTT n-Nitroso-di-n-Propylam 0.025 U mq/L **EPA** 8270 08/30 09/06 MIT Hexachloroethane 0.025 U mg/L **EPA** 8270 08/30 09/06 MTT Nitrobenzene 0.025 U mg/L **EPA** 8270 08/30 09/06 MIT Isophorone 0.025 U mg/L EPA 8270 08/30 09/06 MTT 2-Nitrophenol 0.025 U mq/L EPA 8270 08/30 09/06 MIT 2.4-Dimethylphenol 0.025 U mg/L EPA 8270 08/30 09/06 MTT Benzoic Acid 0.025 U mg/L EPA 8270 08/30 09/06 MTT bis(2-Chloroethoxy)Meth 0.025 U mq/L EPA 8270 08/30 09/06 MTT 2,4-Dichlorophenol 0.025 U mg/L EPA 8270 08/30 09/06 MTT 1,2,4-Trichlorobenzene 0.025 U mg/L EPA 8270 08/30 09/06 MTT Naphthalene 0.025 U mg/L **EPA** 8270 08/30 09/06 MTT 4-Chloroaniline 0.025 U EPA 8270 mg/L 08/30 09/06 MTT Hexachlorobutadiene 0.025 U mg/L **EPA** 8270 08/30 09/06 MTT 4-Chloro-3-Methylphenol 0.025 H mg/L EPA 8270 08/30 09/06 MIT 2-Methylnaphthalene 0.025 U mg/L EPA 8270 08/30 09/06 MTT Hexachlorocyclopentadie 0.025 U mg/L EPA 8270 08/30 09/06 MTT 2,4,6-Trichlorophenol 0.025 U mg/L EPA 8270 08/30 09/06 MTT 2,4,5-Trichlorophenol 0.025 U mg/L EPA 8270 08/30 09/06 MT



COMMERCIAL TESTING & ENGINEERING CO. ENVIRONMENTAL LABORATORY SERVICES

		REP	ORT of ANA	LYSIS WE			
Chemlab Ref.# :93.4356-2				700		5633 B ST ANCHORAGE, AK	
Client Sample ID :LAY-EB02	POINT LAY					TEL: (907) 562	
Matrix :WATER						FAX: (907) 561	
2-Chloronaphthalene	0 025	7.1	45	55. 0.770		00 100 00 101	
2-Nitroaniline	0.025	U	mg/L	EPA 8270		08/30 09/06	MTT
Dimethylphthalate	0.025	U	mg/L	EPA 8270		08/30 09/06	MTT
Acenaphthylene	0.025	U	mg/L	EPA 8270		08/30 09/06	MTT
	0.025	U	mg/L	EPA 8270		08/30 09/06	MTT
2,6-Dinitrotoluene	0.025	U	mg/L	EPA 8270		08/30 09/06	MTT
3-Nitroaniline	0.025	U	mg/L	EPA 8270		08/30 09/06	MTT
Acenaphthene	0.025	U	mg/L	EPA 8270		08/30 09/06	MTT
2,4-Dinitrophenol	0.025	U	mg/L	EPA 8270		08/30 09/06	MTT
4-Nitrophenol	0.025	U	mg/L	EPA 8270		08/30 09/06	MTT
Dibenzofuran	0.025	U	mg/L	EPA 8270		08/30 09/06	MTT
2,4-Dinitrotoluene	0.025	U	mg/L	EPA 8270		08/30 09/06	MTT
Diethylphthalate	0.025	U	mg/L	EPA 8270		08/30 09/06	MTT
4-Chlorophenyl-Phenylet	0.025	U	mg/L	EPA 8270		08/30 09/06	MTT
Fluorene	0.025	U	mg/L	EPA 8270		08/30 09/06	MTT
4-Nitroaniline	0.025	U	mg/L	EPA 8270		08/30 09/06	MTT
4,6-Dinitro-2-Methylphe	0.025	U	mg/L	EPA 8270		08/30 09/06	MTT
n-Nitrosodiphenylamine	0.025	U	mg/L	EPA 8270		08/30 09/06	MTT
4-Bromophenyl-Phenyleth	0.025	U	mg/L	EPA 8270		08/30 09/06	MTT
Hexachlorobenzene	0.025	U	mg/L	EPA 8270		08/30 09/06	MTT
Pentachlorophenol	0.025	U	mg/L	EPA 8270		08/30 09/06	MTT
Phenanthrene	0.025	U	mg/L	EPA 8270		08/30 09/06	MTT
Anthracene	0.025	U	mg/L	EPA 8270		08/30 09/06	MTT
n-Butylphthalate	0.025	U	mg/L	EPA 8270		08/30 09/06	MTT
oranthene	0.025	Ū	mg/L	EPA 8270		08/30 09/06	MTT
Pyrene	0.025	U	mg/L	EPA 8270		08/30 09/06	MTT
Butylbenzylphthalate	0.025	Ū	mg/L	EPA 8270		08/30 09/06	MTT
3,3-Dichlorobenzidine	0.025	Ū	mg/L	EPA 8270		08/30 09/06	MTT
Benzo(a)Anthracene	0.025	Ū	ng/L	EPA 8270		08/30 09/06	MTT
Chrysene	0.025	Ū	mg/L	EPA 8270		08/30 09/06	HTT
bis(2-Ethylhexyl)Phthal	0.025	ŭ	mg/L	EPA 8270		08/30 09/06	HTT
di-n-Octylphthalate	0.025	Ü	mg/L	EPA 8270		08/30 09/ 06	HTT
Benzo(b)Fluoranthene	0.025	Ü	mg/L	EPA 8270		08/30 09/ 06	MTT
Benzo(k)Fluoranthene	0.025	Ü	mg/L	EPA 8270		08/30 09/06	MTT
Benzo(a)Pyrene	0.025	Ü	mg/L	EPA 8270		08/30 09/06	MTT
Indeno(1,2,3-cd)Pyrene	0.025	Ü	mg/L	EPA 8270		08/30 09/06	MTT
Dibenz(a,h)Anthracene	0.025	ŭ	mg/L	EPA 8270		08/30 09/06	MTT
Benzo(g,h,i)Perylene	0.025	_	mg/L	EPA 8270		08/30 09/06	
	0.025	J	"My L	EFR 0270		00/30 03/00	MTT
Total Metals Analysis				-			
ICP Screen, ICF				EPA	n/a		
Aluminum	0.10	U	mg/L	EPA 6010	, _	09/02 09/06	DLG
Antimony	0.10	Ü	mg/L	EPA 6010		09/02 09/06	DLG
Arsenic	0.10	Ū	mg/L	EPA 6010		09/02 09/06	DLG
Barium	0.050	Ū	mg/L	EPA 6010		09/02 09/06	DLG
Beryllium	0.050	Ŭ	mg/L	EPA 6010		09/02 09/06	DLG
Cadmium	0.050	Ü	mg/L	EPA 6010		09/02 09/06	DLG
Calcium	0.41	_	mg/L	EPA 6010		09/02 09/06	DLG
Chromium	0.050	U	mg/L	EPA 6010		09/02 09/06	DLG
Cobalt	0.10	Ü	mg/L	EPA 6010		09/02 09/06	DLG
Copper	0.050	Ü	mg/L	EPA 6010		09/02 09/06	DLG
Ison	0.10	Ü	mg/L	EPA 6010		09/02 09/06	DLG
		_	3/ 🚨			33/02 03/00	229





ENVIRONMENTAL LABORATORY SERVICES

3 4CE 4.F			DET	OPT OF ANA	LYSIS XX 🤇				
Chemlab Ref.# Client Sample II Matrix	:93.4356-2 D:LAY-EB02 :WATER	POINT LAY		ORI OI AMA	Lisis		TE	5633 B ST DRAGE, AK EL: (907) 562 XX: (907) 561	99518 2-2343
Lead Magnesium Manganese Molybdenum Nickel		0.10 0.20 0.050 0.050	U U U	mg/L mg/L mg/L mg/L	EPA 6010 EPA 6010 EPA 6010)))	09/02 09/02 09/02 09/02	09/06 09/06 09/06	DLG DLG DLG DLG
Potassium Selenium Silver Sodium		0.050 5.0 0.10 0.050 0.37	U U U	mg/L mg/L mg/L mg/L mg/L	EPA 6010 EPA 6010 EPA 6010 EPA 6010)))	09/02 09/02 09/02 09/02 09/02	09/06 09/06 09/06	DLG DLG DLG DLG DLG
Thallium Vanadium Zinc		0.005 0.050 0.050	U U	mg/L mg/L mg/L	EPA 6010 EPA 6010	L)	09/03 09/02 09/15	09/08 09/06	BMW DLG DFL
Dissolved Meta ICP Screen, IC Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt Copper	T Analys	0.10 0.10 0.10 0.050 0.050 0.050 0.20 0.050 0.10	ט ט ט ט ט	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010		a 09/02 09/02 09/02 09/02 09/02 09/02 09/02 09/02	09/06 09/06 09/06 09/06 09/06 09/06 09/06	DLG DLG DLG DLG DLG DLG DLG DLG DLG DLG
Iron Lead Magnesium Manganese Molybdenum Nickel Potassium Selenium Silver Sodium Thallium		0.10 0.20 0.050 0.050 0.050 5.0 0.10 0.050 0.40	ם ה ה ה ה ה ה ה ה ה ה ה ה ה ה ה ה ה ה ה	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 7841		09/02 09/02 09/02 09/02 09/02 09/02 09/02 09/02 09/02	09/06 09/06 09/06 09/06 09/06 09/06 09/06 09/06	DLG DLG DLG DLG DLG DLG DLG DLG DLG DLG
Vanadium Zinc		0.050 0.050	บ บ	mg/L mg/L	EPA 6010 EPA 6010		09/02 09/15	09/06	DLG DFL

** See Sample Remarks Above

 $\underline{\mathbf{U}}$ = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed

LT = Less Than GT = Greater Than



Member of the SGS Group (Société Générale de Surveillance)

See Special Instructions Above



ENVIRONMENTAL LABORATORY SERVICES

mlab Ref.#

:93.4356-4

Client Sample ID :LAY-EB02 POINT LAY DUPLICATE

Matrix

:WATER

REPORT of ANALYSIS

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343

FAX: (907) 561-5301

Client Name

:ICF KAISER ENGINEERING

Ordered By

:RAY MORRIS

Project Name Project#

:DEW LINE RI/FS :41096-412-01

PWSID

:UA

WORK Order

:70116

Report Completed :10/06/93 Collected

:08/24/93 @ 13:50 hrs.

Received

:08/26/93 @ 12:00 hrs.

Technical Director: STEPHEN, C. EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON. 8270: SAMPLE

WAS PREPED WITH 4357-2,3 SPIKE AND DUP.

Parameter	Results	QC Oual	Unite	Method	Allowable Limits	Ext. Date	Anal Date	Init
				ne chod				
Total Metals Analysis				-				
ICP Screen, ICF				EPA	n/a			
Aluminum	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Antimony	0.10	U	mg/L	EPA 6010			09/06	DLG
Arsenic	0.10	U	mg/L	EPA 6010			09/06	DLG
Barium	0.050	U	mg/L	EPA 6010			09/06	DLG
Beryllium	0.050	Ü	mg/L	EPA 6010			09/06	DLG
Cadmium	0.050	U	mg/L	EPA 6010			09/06	DLG
Calcium	0.31		mg/L	EPA 6010		09/02	09/06	DLG
promium	0.050	U	mg/L	EPA 6010			09/06	DLG
obalt	0.10	U	mg/L	EPA 6010			09/06	DLG
Copper	0.050	บ	mg/L	EPA 6010			09/06	DLG
Iron	0.10	U	mg/L	EPA 6010			09/06	DLG
Lead	0.10	Ü	mg/L	EPA 6010			09/06	DLG
Magnesium	0.20	U	mg/L	EPA 6010			09/06	DLG
Manganese	0.050	U	mg/L	EPA 6010			09/06	DLG
Molybdenum	0.050	U	mg/L	EPA 6010			09/06	DLG
Nickel	0.050	U	mg/L	EPA 6010			09/06	DLG
Potassium	5.0	U	mg/L	EPA 6010			09/06	DLG
Selenium	0.10	U	mg/L	EPA 6010			09/06	DLG
Silver	0.050	Ü	mg/L	EPA 6010			09/06	DLG
Sodium	0.39		mg/L	EPA 6010			09/06	DLG
Thallium	0.005	U	mg/L	EPA 7841			09/08	BMW
Vanadium	0.050	U	mg/L	EPA 6010		09/02	09/06	DLG
Zinc			mg/L	EPA 6010				
Dissolved Metals Analys				_				
ICP Screen, ICF				EPA	n/a			
Aluminum	0.10	U	mg/L	EPA 6010		09/02	09/06	DLG
Antimony	0.10	U	mg/L	EPA 6010			09/06	DLG
Arsenic	0.10	U	mg/L	EPA 6010			09/06	DLG
Barium	0.050	บ	mg/L	EPA 6010			09/06	DLG
Beryllium	0.050	U	mg/L	EPA 6010			09/06	DLG
Cadmium	0.050	Ü	mg/L	EPA 6010			09/06	DLG
Calcium	0.20	Ū	mg/L	EPA 6010			09/06	DLG
Chromium	0.050	Ū	mg/L	EPA 6010			09/06	DLG
Cobalt	0.10	Ü	mg/L	EPA 6010			09/06	DLG
•		-	5, 2			37, 34	,	



REPORT of ANALYSIS

ENVIRONMENTAL LABORATORY SERVICES

5-4CE	190€				

Chemlab Ref.# Client Sample ID Matrix	:93.4356-4 :LAY-EB02 :WATER	POINT LAY	DUI	PLICATE			TE	DRAGE, AK 9 EL: (907) 562- AX: (907) 561-	9518 -2343
Copper		0.050	U	mg/L		6010	09/02		DLG
Iron		0.10	U	mg/L		6010	09/02	-	DLG
Lead		0.10	U	mg/L		6010	09/02	•	DLG
Magnesium		0.20	U	mg/L	EPA	6010	09/02	09/06	DLG
Manganese		0.050	U	mg/L	EPA	6010	09/02	•	DLG
Molybdenum		0.050	U	mg/L	EPA	6010	09/02	09/06	DLG
Nickel		0.050	U	mg/L	EPA	6010	09/02	09/06	DLG
Potassium		5.0	U	mg/L	EPA	6010	09/02	09/06	DLG
Selenium		0.10	U	mg/L	EPA	6010	09/02	09/06	DLG
Silver		0.050	Ü	mg/L	EPA	6010	09/02	09/06	DLG
Sodium		0.40		mg/L		6010	09/02	09/06	DLG
Thallium		0.005	U	mg/L		7841	09/03	09/08	BMW
Vanadium		0.050	Ū	mg/L		6010	09/02	09/06	DLG
Zinc			_	mg/L		6010			
				_					

See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable

5633 B STREET

NA = Not AnalyzedLT = Less Than



GT = Greater Than

See Special Instructions Above



REPORT of ANALYSIS

ENVIRONMENTAL LABORATORY SERVICES

mlab Ref.# :93.4356-3

Client Sample ID :LAY-EB02 POINT LAY SPIKE

:ICF KAISER ENGINEERING

Matrix

Client Name

Ordered By

Project#

Project Name

:WATER

:RAY MORRIS

:DEW LINE RI/FS

:41096-412-01

WORK Order :70116

Report Completed :10/06/93

Collected :08/24/93 @ 13:50 hrs. Received :08/26/93 @ 12:00 hrs.

5633 B STREET

TEL: (907) 562-2343 FAX: (907) 561-5301

ANCHORAGE, AK 99518

Technical Director: STEPHEN_C, EDE,

Released By : Styl C- Tell

PWSID :UA

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.021		mg/L	EPA 8260		09/02	09/02	MCM
Bromobenzene	0.0010	U	mg/L	EPA 8260			09/02	MCM
Bromochloromethane	0.0010	U	mg/L	EPA 8260		09/02		MCM
Bromodichloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromoform	0.0010	U	mg/L	EPA 8260		09/02		MCM
Bromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
sec-Butylbenzene	0.0010	Ü	mg/L	EPA 8260		09/02	09/02	MCM
<u>t</u> ert-Butylbenzne	0.0010	Ü	mg/L	EPA 8260		09/02	09/02	MCM
arbon Tetrachloride	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
- nlorobenzene	0.021		mg/L	EPA 8260		09/02	09/02	MCM
Chloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloroform	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Chloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
2-Chlorotoluene	0.0010	Ü	mg/L	EPA 8260		09/02	09/02	MCM
4-Chlorotoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
12Dibromo3Chloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dibromomethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,3-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,4-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Dichlorodifluoromethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloroethene	0.020		mg/L	EPA 8260		09/02	09/02	MCM
cis-1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
trans1,2-Dichloroethene	0.0010	บ	mg/L	EPA 8260		09/02	09/02	MCM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,3-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
2,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
1,1-Dichloropropene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Ethylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Hexachlorobutadiene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Isopropylbenzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
p-Isopropyltoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS 5633 B STREET Chemlab Ref.# :93.4356-3 ANCHORAGE, AK 99518 Client Sample ID : LAY-EB02 POINT LAY SPIKE TEL: (907) 562-2343 Matrix :WATER FAX: (907) 561-5301 Methylene Chloride 0.0025 EPA 8260 09/02 09/02 mq/L MCM Napthalene 0.0010 U **EPA 8260** 09/02 09/02 MCM mg/L n-Propylbenzene 0.0010 U mg/L **EPA** 8260 09/02 09/02 MCM Styrene 0.0010 U EPA 8260 09/02 09/02 mg/L MCM 1112-Tetrachloroethane 0.0010 09/02 09/02 **EPA 8260** MCM mg/L 1122-Tetrachloroethane 0.0010 EPA 8260 09/02 09/02 MCM mg/L Tetrachloroethene 0.0010 09/02 09/02 H **EPA** 8260 mg/L MCM Toluene 0.021 09/02 09/02 **EPA** 8260 mg/L MCM 1,2,3-Trichlorobenzene 0.0010 U 09/02 09/02 mg/L **EPA** 8260 MCM 1,2,4-Trichlorobenzene 0.0010 II EPA 8260 09/02 09/02 MCM mg/L 1,1,1-Trichloroethane 0.0010 mg/L EPA 8260 09/02 09/02 MCM 1,1,2-Trichloroethane 0.0010 **EPA 8260** 09/02 09/02 MCM mq/L Trichloroethene 0.019 EPA 8260 09/02 09/02 mq/L MCM Trichlorofluoromethane 0.0010 U **EPA** 8260 09/02 09/02 MCM mq/L 1,2,3-Trichloropropane 0.0010 EPA 8260 09/02 09/02 MCM mg/L 1,2,4-Trimethylbenzene 0.0010 EPA 8260 09/02 09/02 MCM mg/L 1,3,5-Trimethylbenzene 0.0010 U EPA 8260 09/02 09/02 MCM mg/L Vinyl Chloride 0.0010 H EPA 8260 09/02 09/02 MCM mq/L p+m-Xylene 0.0010 U mg/L EPA 8260 09/02 09/02 MCM o-Xylene 0.0010 U **EPA** 8260 09/02 09/02 mg/L MCM Total Metals Analysis ICP Screen, ICF **EPA** n/a Aluminum 1.06 09/02 09/06 EPA 6010 mg/L Antimony 0.87 EPA 6010 09/02 09/06 DLG mg/L Arsenic 0.89 **EPA 6010** 09/02 09/06 DLG mg/L Barium 0.98 09/02 09/06 **EPA** 6010 DLG mg/L Beryllium 0.38 mg/L **EPA** 6010 09/02 09/06 DLG Cadmium 0.46 09/02 09/06 mg/L **EPA** 6010 DLG Calcium 9.24 09/02 09/06 DLG mg/L **EPA** 6010 Chromium 0.96 09/02 09/06 **EPA** 6010 DLG mg/L Cobalt 0.93 09/02 09/06 DLG **EPA** 6010 mg/L Copper 0.99 09/02 09/06 DLG **EPA** 6010 mg/L Iron 0.94 09/02 09/06 DLG **EPA** 6010 mg/L Lead 0.89 09/02 09/06 DLG **EPA** 6010 mg/L Magnesium 9.2 09/02 09/06 DLG mg/L **EPA** 6010 Manganese 0.98 mg/L **EPA** 6010 09/02 09/06 DLG Molybdenum 0.94 09/02 09/06 mg/L **EPA** 6010 DLG Nickel 09/02 09/06 0.93 DLG mg/L EPA 6010 Potassium 9.0 09/02 09/06 mq/L EPA 6010 DLG Selenium 09/02 09/06 0.88 **EPA** 6010 DLG mg/L Silver 0.13 EPA 6010 09/02 09/06 DLG mq/L Sodium 9.38 EPA 6010 09/02 09/06 DLG mg/L Thallium 0.0175 EPA 7841 09/03 09/08 BMW mg/L Vanadium 0.92 **EPA** 6010 09/02 09/06 DLG mg/L Zinc **EPA 6010** mg/L Dissolved Metals Analys ICP Screen, ICF EPA n/a Aluminum 09/02 09/06 DLG 1.04 ma/L EPA 6010



0.88

Antimony

EPA 6010

09/02 09/06

mg/L

ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.#	:93.4356-3	R	EPORT of ANAL	YSIS XX	5633 B STREET			
Client Sample ID Matrix		POINT LAY	ANCHORAGE. AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301	TEL: (907) 562-2343				
Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Molybdenum Nickel Potassium Selenium Silver Sodium Thallium		0.91 1.00 0.39 0.48 9.4 0.98 0.95 0.98 0.96 0.91 9.0 1.00 0.97 0.95 8.3 0.88 0.094 8.72 0.0185	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010 EPA 6010	09/02 09/06 DL 09/02 09/06 DL 09/02 09/06 DL 09/02 09/06 DL 09/02 09/06 DL 09/02 09/06 DL 09/02 09/06 DL 09/02 09/06 DL 09/02 09/06 DL 09/02 09/06 DL 09/02 09/06 DL 09/02 09/06 DL 09/02 09/06 DL 09/02 09/06 DL 09/02 09/06 DL	66666666666666666666666666666666666666		
Vanadium Zinc		0.94	mg/L mg/L mg/L	EPA 7841 EPA 6010 EPA 6010	09/03 09/08 BM 09/02 09/06 DL			

See Special Instructions Above See Sample Remarks Above

Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed

LT = Less Than

GT = Greater Than



SGS Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4356-16

Client Sample ID :LAY-EB02 POINT LAY SPIKE DUPLICATE

Matrix :WATER

Client Name

:ICF KAISER ENGINEERING

Ordered By Project Name :RAY MORRIS :DEW LINE RI/FS :41096-412-01

Project# PWSID

:UA

WORK Order

:70116

Report Completed :10/06/93 Collected

:08/24/93 @ 13:50 hrs.

:08/26/93 @ 12:00 hrs.

5633 B STREET

ANCHORAGE, AK 99518

TEL: (907) 562-2343 FAX: (907) 561-5301

Received Technical Director: STEPHEN, C. EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.021		mg/L	EPA 8260			09/02	MCM
Bromobenzene	0.0010	U	mg/L	EPA 8260		09/02		MCM
Bromochloromethane	0.0010	U	mg/L	EPA 8260		09/02		MCM
Bromodichloromethane	0.0010	U	mg/L	EPA 8260		09/02		MCM
Bromoform	0.0010	U	mg/L	EPA 8260		09/02		MCM
Bromomethane	0.0010	U	mg/L	EPA 8260		09/02		MCM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02		MCM
sec-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/02		MCM
tert-Butylbenzne	0.0010		mg/L	EPA 8260		09/02		MCM
Carbon Tetrachloride	0.0010	U	mg/L	EPA 8260		09/02		MÇ
Chlorobenzene	0.020		mg/L	EPA 8260		09/02		MC
Chloroethane	0.0010	U	mg/L	EPA 8260		09/02		MCM
Chloroform	0.0010		mg/L	EPA 8260		09/02		MCM
Chloromethane	0.0010		mg/L	EPA 8260		09/02		MCM
2-Chlorotoluene	0.0010		mg/L	EPA 8260		09/02		MCM
4-Chlorotoluene	0.0010		mg/L	EPA 8260		•	09/02	. HCM
Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/02		MCM
12Dibromo3Chloropropane	0.0010	U	mg/L	EPA 8260			09/02	HCM
1,2-Dibromoethane	0.0010		mg/L	EPA 8260		09/02		MCM
Dibromomethane	0.0010		mg/L	EPA 8260			09/02	MCM
1,2-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02		MCM
1,3-Dichlorobenzene	0.0010		mg/L	EPA 8260		09/02		MCM
1,4-Dichlorobenzene	0.0010		mg/L	EPA 8260		09/02		MCM
Dichlorodifluoromethane	0.0010		mg/L	EPA 8260			09/02	HCM
1,1-Dichloroethane	0.019		mg/L	EPA 8260		09/02	-	MCM
1,2-Dichloroethane	0.0010		mg/L	EPA 8260		09/02		MCM
1,1-Dichloroethene	0.0019		mg/L	EPA 8260		09/02		MCM
cis-1,2-Dichloroethene	0.0010		mg/L	EPA 8260			09/02	MCM
trans1,2-Dichloroethene	0.0010		mg/L	EPA 8260		09/02		MCM
1,2-Dichloropropane	0.0010		mg/L	EPA 8260		09/02		MCM
1,3-Dichloropropane	0.0010		mg/L	EPA 8260		09/02		MCM
2,2-Dichloropropane	0.0010		mg/L	EPA 8260			09/02	MCM
1,1-Dichloropropene	0.0010		mg/L	EPA 8260			09/02	MCM
Ethylbenzene	0.0010		mg/L	EPA 8260			09/02	MCM
Hexachlorobutadiene	0.0010		mg/L	EPA 8260		09/02		MCM
Isopropylbenzene	0.0010		mg/L	EPA 8260		09/02		MCM MCM
p-Isopropyltoluene	0.0010	U	mg/L	EPA 8260		09/02	09/02	nen



ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS 5633 B STREET mlab Ref.# :93.4356-16 ANCHORAGE, AK 99518 Client Sample ID :LAY-EB02 POINT LAY SPIKE DUPLICATE TEL: (907) 562-2343 FAX: (907) 561-5301 Matrix :WATER Methylene Chloride 0.0025 mg/L **EPA** 8260 09/02 09/02 MCM Napthalene 0.0010 09/02 09/02 U mg/L EPA 8260 MCM n-Propylbenzene 0.0010 09/02 09/02 U mq/L **EPA** 8260 MCM Styrene 0.0010 U mg/L **EPA** 8260 09/02 09/02 MCM 1112-Tetrachloroethane 09/02 09/02 0.0010 U mg/L EPA 8260 MCM 1122-Tetrachloroethane 0.0010 U mg/L EPA 8260 09/02 09/02 MCM Tetrachloroethene 0.0010 U mg/L EPA 8260 09/02 09/02 MCM Toluene **EPA** 8260 0.021 09/02 09/02 mg/L MCM 1,2,3-Trichlorobenzene 0.0010 U **EPA** 8260 09/02 09/02 mg/L MCM 1,2,4-Trichlorobenzene 0.0010 U EPA 8260 09/02 09/02 mg/L MCM 1,1,1-Trichloroethane 0.0010 U EPA 8260 09/02 09/02 MCM mq/L 1,1,2-Trichloroethane 0.0010 EPA 8260 09/02 09/02 mq/L MCM Trichloroethene 0.019 09/02 09/02 mg/L EPA 8260 MCM Trichlorofluoromethane 0.0010 U EPA 8260 09/02 09/02 mg/L MCM 1,2,3-Trichloropropane 0.0010 U mg/L EPA 8260 09/02 09/02 MCM 1,2,4-Trimethylbenzene 0.0010 U **EPA** 8260 09/02 09/02 mq/L MCM 1,3,5-Trimethylbenzene 0.0010 U EPA 8260 09/02 09/02 MCM mg/L Vinyl Chloride 0.0010 U **EPA** 8260 09/02 09/02 MCM mg/L p+m-Xylene 0.0010 U 09/02 09/02 EPA 8260 MCM mg/L o-Xylene 0.0010 U EPA 8260 09/02 09/02 MCM mg/L

See Special Instructions Above See Sample Remarks Above

Undetected, Reported value is the practical quantification limit. D = Secondary dilution.



UA = Unavailable

LT = Less Than

NA = Not Analyzed

GT = Greater Than



COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS

Chemlab Ref.# :93.4692-17 Client Sample ID :LAY-EB03

:WATER Matrix

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343 FAX: (907) 561-5301

Client Name Ordered By

:ICF KAISER ENGINEERING

Project Name Project#

:SHERI K ACE :DEW LINE RI/FS :41096-412-01

PWSID :UA WORK Order :70792

Report Completed :10/01/93

@ 18:00 hrs Collected :09/07/93 @ 12:00 hrs :09/09/93 Received

Technical Director: STEPHEN, C. EDE

Quality //comments

Released By :

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA.**THESE COMPOUNDS WERE NOT CALIBRATED

FOR AT THE TIME. SAMPLE HAD TO BE RUN FOR 8260 SO HOLDING TIMES WOULD NOT BE EXCEEDED. B = THIS FLAG IS USED WHEN THE ANALYTE IS FOUND IN

THE ASSOCIATED BLANK AS WELL AS IN THE SAMPLE.

				(ÝU	aliful / Conn	nu1>		
		QC		V <u>=</u>	Allowable	Ext.	Anal	
Parameter	Results		Units	Method	Limits	Date	Date	Init
Volatile Organics				EPA 8260				
Benzene	0.0010	บ	mg/L	EPA 8260			09/20	KWM
Bromobenzene	0.0010	U	mg/L	EPA 8260		09/20		KWM
Bromochloromethane	0.0010	U	mg/L	EPA 8260		09/20		KWM
Bromodichloromethane	0.0010	U	mg/L	EPA 8260		09/20		KWM
Bromoform	0.0010	U	mg/L	EPA 8260			09/20	
Bromomethane	0.0010	Ü	mg/L	EPA 8260			09/20	MM
n-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
sec-Butylbenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
tert-Butylbenzne	0.0010	IJ	mg/L	EPA 8260		09/20	09/20	KWM
Carbon Tetrachloride	0.0010	Ū	mg/L	EPA 8260		09/20	09/20	KWM
Chlorobenzene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chloroethane	0.0010	Ū	mg/L	EPA 8260		09/20	09/20	KWM
Chloroform	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Chloromethane	0.0031	В	mg/L	EPA 8260 $/\omega$)	-E.I	09/20	09/20	KWM
2-Chlorotoluene	0.0010	Ū	mg/L	EPA 8260		09/20	09/20	KWM
4-Chlorotoluene	0.0010	Ū	mg/L	EPA 8260		09/20	09/20	KWM
Dibromochloromethane	0.0010	Ū	mg/L	EPA 8260		09/20	09/20	KWM
12Dibromo3Chloropropane	**		mg/L	EPA 8260(C))-C.1			
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
Dibromomethane	0.0010	Ū	mg/L	EPA 8260		09/20	09/20	KWM
1.2-Dichlorobenzene	0.0010	ប	mg/L	EPA 8260		09/20	09/20	KWM
1,3-Dichlorobenzene	0.0010	Ü	mg/L	EPA 8260		09/20	09/20	KWM
1,4-Dichlorobenzene	0.0010	Ü	mg/L	EPA 8260			09/20	KWM
Dichlorodifluoromethane	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260			09/20	KWH
1,2-Dichloroethane	0.0010	Ū	mg/L	EPA 8260		09/20	09/20	KWM
1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260			09/20	KWM
cis-1,2-Dichloroethene	0.0046	-	mg/L	EPA 8260		09/20	09/20	KWM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/20	09/20	KWM
1,2-Dichloropropane	0.0010	Ū	mg/L	EPA 8260		09/20	09/20	KWM
1,3-Dichloropropane	0.0010	Ū	mg/L	EPA 8260	•		09/20	KWH
2,2-Dichloropropane	0.0010	Ũ	mg/L	EPA 8260			09/20	KWM
1.1-Dichloropropene	0.0010	Ū	mg/L	EPA 8260			09/20	WH
Ethylbenzene	0.0010	Ŭ	mg/L	EPA 8260		09/20	09/20	WM
			- · -					





o-Xylene

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS 5633 B STREET Chemlab Ref.# :93.4692-17 ANCHORAGE, AK 99518 Client Sample ID :LAY-EB03 TEL: (907) 562-2343 FAX: (907) 561-5301 Matrix :WATER Hexachlorobutadiene mg/L EPA 8260 Isopropylbenzene 0.0010 09/20 09/20 mg/L **EPA** 8260 KWE p-Isopropyltoluene 0.0010 **EPA 8260** U mg/L 09/20 09/20 KWM Methylene Chloride 0.0034 **EPA** 8260 09/20 09/20 mg/L KWM EPA 8260 (R)-C.1 Napthalene mg/L 0.0010 09/20 09/20 n-Propylbenzene U EPA 8260 mq/L KWM Styrene 0.0010 U 09/20 09/20 mg/L EPA 8260 KWM 1112-Tetrachloroethane 0.0010 U **EPA** 8260 09/20 09/20 KWM mg/L 1122-Tetrachloroethane 0.0010 EPA 8260 U 09/20 09/20 mg/L KWM Tetrachloroethene 0.0010 U mg/L EPA 8260 09/20 09/20 KWM Toluene 0.0010 mg/L EPA 8260 09/20 09/20 KWM EPA 8260 (C) - C.1 1,2,3-Trichlorobenzene mq/L ** 1,2,4-Trichlorobenzene mg/L EPA 8260 (R)-C.1 1,1,1-Trichloroethane 0.0010 mq/L EPA 8260 09/20 09/20 KWM 1,1,2-Trichloroethane 0.0010 mg/L EPA 8260 09/20 09/20 KWM Trichloroethene 0.0017 EPA 8260 09/20 09/20 mg/L KWM Trichlorofluoromethane 0.0010 EPA 8260 09/20 09/20 mg/L KWM 1,2,3-Trichloropropane 0.0010 EPA 8260 U mg/L 09/20 09/20 KWH 1,2,4-Trimethylbenzene 0.0010 U mg/L EPA 8260 09/20 09/20 KWM 1,3,5-Trimethylbenzene 0.0010 U mg/L EPA 8260 09/20 09/20 KWM Vinyl Chloride 0.0010 U mg/L EPA 8260 09/20 09/20 KWM p+m-Xylene 0.0010 U mg/L EPA 8260 09/20 09/20 KWM

mg/L

EPA 8260

See Special Instructions Above

See Sample Remarks Above

U = Undetected, Reported value is the practical quantification limit.

0.0010

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed LT = Less Than

09/20 09/20

KWM

GT = Greater Than



SGS Member of the SGS Group (Société Générale de Surveillance)



ENVIRONMENTAL LABORATORY SERVICES



5633 B STREET

REPORT of ANALYSIS

Chemlab Ref.#

:93.4328-1 Client Sample ID :LAY-TB01 POINT LAY

ANCHORAGE, AK 99518 EL: (907) 562-2343 FAX: (907) 561-5301

Matrix

:WATER

WORK Order :70060

Client Name Ordered By

:ICF KAISER ENGINEERING :RAY MORRIS

Report Completed :09/20/93 Collected

Project Name Project#

:DEW LINE RI/FS :41096-412-01

:08/23/93 @ 10:00 hrs :08/25/93 @ 12:00 hrs

PWSID

:UA

Received Technical Director: STEPHEN C. EDE

Released By : 1

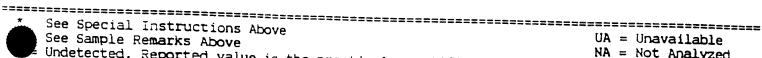
Sample Remarks: SAMPLE COLLECTED BY: A. POLOUSKY AND S.S. SEPPOVEN.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	In it
Volatile Organics				EPA 8260				
Benzene	0.0010	ប	mg/L	EPA 8260		22.42.5		
Bromobenzene	0.0010	Ü	mg/L				09/02	KWM
Bromochloromethane	0.0010	ŭ	mg/L	EPA 8260		09/02	09/02	KWM
Bromodichloromethane	0.0010	Ü	mg/L	EPA 8260			09/02	KWM
Bromoform	0.0010	Ü	mg/L	EPA 8260			09/02	KWM
Bromomethane	0.0010	Ü	mg/L	EPA 8260			09/02	KWM
n-Butylbenzene	0.0010	Ü	mg/L	EPA 8260 EPA 8260			09/02	KWM
s ec -Butylbenzene	0.0010	Ü	mg/L				09/02	KWM
tert-Butylbenzne	0.0010	Ü	mg/L	EPA 8260 EPA 8260		09/02	09/02	M
Carbon Tetrachloride	0.0010	ŭ	mg/L	EPA 8260			09/02	H
Chlorobenzene	0.0010	Ü	mg/L	EPA 8260			09/02	KWM
Chloroethane	0.0010	Ü	mg/L				09/02	KWM
Chloroform	0.0010	บ	_	EPA 8260			09/02	KWH
Chloromethane	0.0010	Ü	mg/L	EPA 8260		09/02		KWM
2-Chlorotoluene	0.0010	Ü	mg/L	EPA 8260		09/02		KWM
4-Chlorotoluene	0.0010	IJ	mg/L	EPA 8260		09/02		KWM
Dibromochloromethane	0.0010	U	mg/L	EPA 8260		09/02		KWM
12Dibromo3Chloropropane	0.0010	•	mg/L	EPA 8260		09/02		KWM
1,2-Dibromoethane	0.0010	U	mg/L	EPA 8260		09/02		KWM
Dibromomethane	0.0010	IJ	mg/L	EPA 8260		09/02		KWM
1,2-Dichlorobenzene	0.0010	-	mg/L	EPA 8260		09/02		KWM
1,3-Dichlorobenzene	0.0010	U	mg/L	EPA 8260		09/02		KWM
1,4-Dichlorobenzene	0.0010	U U	mg/L	EPA 8260		09/02	09/02	KWM
Dichlorodifluoromethane	0.0010	U	mg/L	EPA 8260		09/02		KWM
1,1-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02		KWH
1,2-Dichloroethane	0.0010	U	mg/L	EPA 8260		09/02		KWM
1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02		KWM
cis-1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02		KWM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02		KWM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02		KWM
1,3-Dichloropropane	0.0010	Ü	mg/L	EPA 8260		09/02		KWM
2,2-Dichloropropane	0.0010	_	mg/L	EPA 8260		09/02		KWM
1,1-Dichloropropene	0.0010	U	mg/L	EPA 8260		09/02		KWM
Ethylbenzene	0.0010	U	mg/L	EPA 8260		09/02		KWM
Hexachlorobutadiene	0.0010	Ü	mg/L	EPA 8260		09/02		KWM
Isopropylbenzene	0.0010	Ü	mg/L	EPA 8260		09/02		KWM
p-Isopropyltoluene	0.0010	U	mg/L	EPA 8260		09/02 (
	0.0010	U	mg/L	EPA 8260	(09/02	09/02	T



ENVIRONMENTAL LABORATORY SERVICES

REPORT OF ANALYSIS SEC Chemlab Ref.# :93.4328-1 5633 B STREET Client Sample ID ANCHORAGE, AK 99518 :LAY-TB01 POINT LAY Matrix TEL: (907) 562-2343 :WATER FAX: (907) 561-5301 Methylene Chloride 0.012 mq/L EPA 8260 Napthalene 09/02 09/02 **KWI** 0.0010 U mg/L EPA 8260 n-Propylbenzene 09/02 09/02 KWI 0.0010 U mg/L EPA 8260 Styrene 09/02 09/02 KWI 0.0010 Ü mg/L EPA 8260 1112-Tetrachloroethane 09/02 09/02 KW 0.0010 mg/L 1122-Tetrachloroethane EPA 8260 09/02 09/02 KW 0.0010 mg/L EPA 8260 Tetrachloroethene 09/02 09/02 KW 0.0010 H mg/L EPA 8260 Toluene 09/02 09/02 **KWP** 0.0010 U mg/L EPA 8260 1,2,3-Trichlorobenzene 09/02 09/02 **KWP** 0.0010 U EPA 8260 mg/L 1,2,4-Trichlorobenzene 09/02 09/02 KWP 0.0010 U mg/L **EPA** 8260 1,1,1-Trichloroethane 09/02 09/02 KW1 0.0010 U EPA 8260 mq/L 1,1,2-Trichloroethane 09/02 09/02 KWE 0.0010 U mq/L EPA 8260 Trichloroethene 09/02 09/02 KWP 0.0010 U mg/L EPA 8260 Trichlorofluoromethane 09/02 09/02 KWE 0.0010 U mg/L EPA 8260 1,2,3-Trichloropropane 09/02 09/02 KWM 0.0010 U mg/L EPA 8260 1,2,4-Trimethylbenzene 09/02 09/02 KWE 0.0010 U mg/L EPA 8260 09/02 09/02 1,3,5-Trimethylbenzene KWM 0.0010 U mg/L EPA 8260 Vinyl Chloride 09/02 09/02 KWH 0.0010 U mg/L EPA 8260 09/02 09/02 p+m-Xylene KWH 0.0010 U mg/L EPA 8260 o-Xylene 09/02 09/02 KWM 0.0010 U mg/L EPA 8260 09/02 09/02 KWN



Undetected. Reported value is the practical quantification limit. D = Secondary dilution.

UA = Unavailable NA = Not Analyzed LT = Less Than GT = Greater Than





ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.#

:93.4356-1

REPORT of ANALYSIS

5633 B STREET ANCHORAGE, AK 99518 TEL: (907) 562-2343

Matrix

:WATER

Client Sample ID :LAY-TB02 POINT LAY

FAX: (907) 561-5301

Client Name

:ICF KAISER ENGINEERING

WORK Order :70116

Collected

Ordered By

:RAY MORRIS

Report Completed :10/06/93

Project Name

:DEW LINE RI/FS :41096-412-01

:08/24/93 @ 08:00 hrs.

Project# PWSID

:UA

Received :08/26/93 @ 12:00 hrs.

Technical Director: STEPHEN C, EDE Released By : STEPHEN C

Sample Remarks: SAMPLE COLLECTED BY: ROBERT C.C. AND JEFF J. DAWSON.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Volatile Organics				EPA 8260				
Benzene	0.0010	U	mg/L	EPA 8260		09/02	09/02	MCM
Bromobenzene	0.0010	Ü	mg/L	EPA 8260			09/02	MCM
Bromochloromethane	0.0010	ti	mg/L	EPA 8260		09/02		MCM
Bromodichloromethane	0.0027	J	mg/L	EPA 8260			09/02	MCM
Bromoform	0.0042		mg/L	EPA 8260		09/02		MCM
Bromomethane	0.0010	U	mg/L	EPA 8260		09/02		MCM
n-Butylbenzene	0.0010	Ü	mg/L	EPA 8260		09/02		MCH
sec-Butylbenzene	0.0010	Ū	mg/L	EPA 8260			09/02	M
tert-Butylbenzne	0.0010	Ū	mg/L	EPA 8260		09/02		H
Carbon Tetrachloride	0.0010	Ū	mg/L	EPA 8260		09/02		MCH
Chlorobenzene	0.0010	ŭ	mg/L	EPA 8260		09/02		MCM
Chloroethane	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
Chloroform	0.0025	•	mg/L	EPA 8260		09/02		MCM
Chloromethane	0.0010	U	mg/L	EPA 8260		09/02		MCM
2-Chlorotoluene	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
4-Chlorotoluene	0.0010	Ü	mg/L	EPA 8260			09/02	
Dibromochloromethane	0.0040	•	mg/L	EPA 8260		09/02		MCM
12Dibromo3Chloropropane	0.0010	U	mg/L	EPA 8260		09/02		MCM
1,2-Dibromoethane	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
Dibromomethane	0.0010	Ü	mg/L	EPA 8260		09/02		HCM
1,2-Dichlorobenzene	0.0010	ŭ	mg/L	EPA 8260		09/02		HCM
1,3-Dichlorobenzene	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
1,4-Dichlorobenzene	0.0010	Ū	mg/L	EPA 8260		09/02		MCM
Dichlorodifluoromethane	0.0010	Ū	mg/L	EPA 8260		09/02		MCM
1,1-Dichloroethane	0.0010	Ū	mg/L	EPA 8260		09/02		MCM
1,2-Dichloroethane	0.0010	Ū	mg/L	EPA 8260		09/02		MCM
1,1-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02		MCM
cis-1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02		MCM
trans1,2-Dichloroethene	0.0010	U	mg/L	EPA 8260		09/02		MCM
1,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02		MCM
1,3-Dichloropropane	0.0010	Ū	mg/L	EPA 8260		09/02		MCM
2,2-Dichloropropane	0.0010	U	mg/L	EPA 8260		09/02		MCM
1,1-Dichloropropene	0.0010	Ü	mg/L	EPA 8260		09/02		MCM
Ethylbenzene	0.0010	U	mg/L	EPA 8260		09/02		MCM
Hexachlorobutadiene	0.0010	U	mg/L	EPA 8260		09/02		MCM
Isopropylbenzene	0.0010	U	mg/L	EPA 8260		09/02		MCM
p-Isopropyltoluene	0.0010	Ü	mg/L	EPA 8260		09/02		M





ENVIRONMENTAL LABORATORY SERVICES

REPORT of ANALYSIS Chemlab Ref.# :93.4356-1 5633 B STREET Client Sample ID :LAY-TB02 POINT LAY ANCHORAGE, AK 99518 TEL: (907) 562-2343 Matrix :WATER FAX: (907) 561-5301 Methylene Chloride 0.012 mg/L **EPA** 8260 09/02 09/02 MCM Napthalene 0.0010 U mg/L EPA 8260 09/02 09/02 MCM n-Propylbenzene 0.0010 U mg/L EPA 8260 09/02 09/02 MCM Styrene 0.0010 U mq/L EPA 8260 09/02 09/02 MCM 1112-Tetrachloroethane 0.0010 U ma/L EPA 8260 09/02 09/02 MCM 1122-Tetrachloroethane 0.0010 U mq/L EPA 8260 09/02 09/02 MCM Tetrachloroethene 0.0010 U EPA 8260 mg/L 09/02 09/02 MCM Toluene 0.0010 U mg/L **EPA** 8260 09/02 09/02 MCM 1,2,3-Trichlorobenzene 0.0010 U **EPA** 8260 mg/L 09/02 09/02 MCM 1,2,4-Trichlorobenzene 0.0010 U EPA 8260 mg/L 09/02 09/02 MCM 1,1,1-Trichloroethane 0.0010 U mg/L **EPA** 8260 09/02 09/02 MCM 1,1,2-Trichloroethane 0.0010 U ma/L **EPA** 8260 09/02 09/02 MCM Trichloroethene 0.0010 U ma/L **EPA** 8260 09/02 09/02 MCM Trichlorofluoromethane 0.0010 U EPA 8260 mq/L 09/02 09/02 MCM 1,2,3-Trichloropropane 0.0010 U mg/L EPA 8260 09/02 09/02 MCM 1,2,4-Trimethylbenzene 0.0010 U EPA 8260 mg/L 09/02 09/02 MCM 1,3,5-Trimethylbenzene 0.0010 Ü mg/L EPA 8260 09/02 09/02 MCM Vinyl Chloride 0.0010 U mg/L EPA 8260 09/02 09/02 MCM p+m-Xylene 0.0010 U mg/L **EPA** 8260 09/02 09/02 MCM o-Xylene 0.0010 U mg/L **EPA** 8260 09/02 09/02 MCM

See Special Instructions Above ee Sample Remarks Above

Undetected, Reported value is the practical quantification limit. D = Secondary dilution.

UA = Unavailable NA = Not Analyzed

LT = Less Than GT = Greater Than



Member of the SGS Group (Société Générale de Surveillance)



رايد المراجع أبوالم

COMMERCIAL TESTING & ENGINEERING CO.

ENVIRONMENTAL LABORATORY SERVICES

Chemlab Ref.# :93.4692-16

Client Sample ID :LAY-TB03 :WATER

Matrix

Client Name :ICF KAISER ENGINEERING

Ordered By Project Name Project#

:SHERI K ACE :DEW LINE RI/FS :41096-412-01

PWSID :UA REPORT of ANALYSIS

ANCHORAGE, AK 99518 TEL: (907) 552-2343 FAX: (907) 561-5301

5633 B STREET

WORK Order :70792 Report Completed :10/01/93

:09/07/93 @ 10:00 hrs Collected Received :09/09/93 @ 12:00 hrs

Technical Director: STEPHEN ,C. EDE

Released By :

Sample Remarks: SAMPLE COLLECTED BY: RCC AND SMA.**THESE COMPOUNDS WERE NOT/CALIBRATED

FOR AT THE TIME. SAMPLE HAD TO BE RUN FOR 8260 SO HOLDING TIMES WOULD NOT BE EXCEEDED. B = THIS FLAG IS USED WHEN THE ANALYTE IS FOUND IN

THE ASSOCIATED BLANK AS WELL AS IN THE SAMPLE.

	THE ASSOCIAT	ED BLANK	AS W	LL AS	IN THE S	AMPLE.	. / /			
						15.,	abbee / Com	nents		
						<u>uu</u>	000			
_			ΩC				Allowable	Ext.	Anal	T_ ! L
Param	eter 	Results	Qual	Units	me'	thod 	Limits	Date 	Date	Init
Volat	ile Organics					8260				
Benze	ne	0.0010	U	mg/L		8260			09/20	KWM
Bromo	benzene	0.0010	Ū	mg/L		8260			09/20	KWM
Bromo	chloromethane	0.0010	Ü	mg/L		8260			09/20	KWM
Bromo	dichloromethane	0.0010	Ü	mg/L		8260			09/20	KWM
Bromo	form	0.0010	U	mg/L		8260			09/20	
Bromo	methane	0.0010	U	mg/L		8260			09/20	
n-But	ylbenzene	0.0010	Ū	mg/L	EPA	8260			09/20	KWM
sec-B	utylbenzene	0.0010	U	mg/L		8260			09/20	KWM
tert-	Butylbenzne	0.0010	U	mg/L	EPA	8260			09/20	KWM
Carbo	n Tetrachloride	0.0010	U	mg/L		8260			09/20	KWM
Chlor	obenzene	0.0010	U	mg/L		8260			09/20	KWM
Chlor	oethane	0.0010	U	mg/L		8260			09/20	KWM
Chlor	oform	0.0010	U	mg/L	EPA	8260			09/20	KWM
	omethane	0.0031	В	mg/L	EPA	8260/W)-	-E.1		09/20	KWM
2-Chl	orotoluene	0.0010	U	mg/L	EPA	8260			09/20	KWM
4-Chl	orotoluene	0.0010	U	mg/L	EPA	8260			09/20	KWM
Dibro	mochloromethane	0.0010	U	mg/L	EPA	8260		09/20	09/20	KWM
12Dib	romo3Chloropropane	**		mg/L	EPA	8260(R)	-C.1			
1,2-D	ibromoethane	0.0010	U	mg/L		8260	9.1		09/20	KWM
Dibro	momethane	0.0010	U	mg/L		8260			09/20	KWM
1,2-D	ichlorobenzene	0.0010	U	mg/L		8260			09/20	KWM
1,3-D	ichlorobenzene	0.0010	U	mg/L		8260			09/20	KWM
1.4-D	ichlorobenzene	0.0010	U	mg/L	EPA	8260			09/20	KWM
Dichl	orodifluoromethane	0.0010	U	mg/L		8260			09/20	KWM
1,1-D	ichloroethane	0.0010	U	mg/L		8260			09/20	KWM
1,2-D	ichloroethane	0.0010	U	mg/L	EPA	8260			09/20	KWM
1,1-D	ichloroethene	0.0010	U	mg/L		8260			09/20	KWM
	,2-Dichloroethene	0.0015		mg/L	EPA	8260			09/20	KWM
trans	1,2-Dichloroethene	0.0010	U	mg/L	EPA	8260			09/20	KWM
	ichloropropane	0.0010	U	mg/L		8260			09/20	KWM
	ichloropropane	0.0010	U	mg/L		8260			09/20	KWM
2,2-D	ichloropropane	0.0010	U	mg/L		8260			09/20	KWM
	ichloropropene	0.0010	U	mg/L		8260			09/20	
	benzene	0.0010	U	mg/L	EPA	8260		09/20	09/20	MM
				-		æ				

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ENVIRONMENTAL LABORATORY SERVICES

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REPORT of ANALYSIS 5633 B STREET Chemlab Ref.# :93.4692-16 ANCHORAGE, AK 99518 Client Sample ID :LAY-TB03 TEL: (907) 562-2343 FAX: (907) 561-5301 Matrix :WATER EPA 8260 / R Hexachlorobutadiene mg/L Isopropylbenzene 0.0010 U **EPA 8260** 09/20 09/20 KWM mg/L 0.0010 EPA 8260 09/20 09/20 KWM p-Isopropyltoluene mg/L 0.0028 **EPA 8260** 09/20 09/20 KWM Methylene Chloride mg/L EPA 8260 (R)-C.1 Napthalene mg/L n-Propylbenzene 0.0010 U mg/L **EPA 8260** 09/20 09/20 KWM Styrene 0.0010 mg/L **EPA 8260** 09/20 09/20 KWM 09/20 09/20 1112-Tetrachloroethane 0.0010 U mg/L EPA 8260 KWM 09/20 09/20 1122-Tetrachloroethane 0.0010 **EPA 8260** KWM II mg/L Tetrachloroethene 0.0010 U EPA 8260 09/20 09/20 KWM mg/L 0.0010 Toluene U EPA 8260 09/20 09/20 KWM mg/L EPA 8260 (R)-C.1 1,2,3-Trichlorobenzene mg/L ** 1,2,4-Trichlorobenzene EPA 8260(R)-C. 1 mg/L 1,1,1-Trichloroethane 0.0010 U mg/L EPA 8260 09/20 09/20 KWM 1,1,2-Trichloroethane 09/20 09/20 0.0010 U mg/L EPA 8260 KWM Trichloroethene 0.0010 EPA 8260 09/20 09/20 U mg/L -KWM Trichlorofluoromethane 0.0010 U EPA 8260 09/20 09/20 KWM mg/L 1.2.3-Trichloropropane 0.0010 U mg/L **EPA 8260** 09/20 09/20 KWM

mg/L

mg/L

mg/L

mg/L

mg/L

EPA 8260

EPA 8260

EPA 8260

EPA 8260

EPA 8260

See Special Instructions Above

See Sample Remarks Above

1,2,4-Trimethylbenzene

1,3,5-Trimethylbenzene

Vinyl Chloride

p+m-Xylene

o-Xylene

U = Undetected, Reported value is the practical quantification limit.

D = Secondary dilution.

UA = Unavailable

NA = Not Analyzed LT = Less Than

09/20 09/20

09/20 09/20

09/20 09/20

09/20 09/20

09/20 09/20

KWM

KWM

KWM

KWM

KWM

GT = Greater Than



ICF ID	LAY-EB01	LAY-EB01	LAY-EB02	LAY-EB02 572	
F&BI Number	443	446	557		
Sample Type	water	water	water	water 8/25/93	
Date Received	8/24/93	8/24/93	8/25/93	0/20/33	
% Dry Weight		"F 00/0F/00	#E 00/27/02		4
Sequence Date		#5-08/25/93	#5-08/27/93		
Leaded Gas		-1000	-1000		
JP-4		<1000	<1000		
Lube Oil		<2000	< 2000		
Diesel		<1000	<1000		
Spike Level					
Unknown Semi-volatile			00		
Pentacosane		100	88		
Sequence Date		#5-08/25/93	#5-08/27/93		
PCB 1221		< 2	< 2		
PCB 1232		< 2	< 2		
PCB 1016		< 2	<2		
PCB 1242		<2	<2		
PCB 1248		<2	<2		
PCB 1254		<2	< 2		
PCB 1260		< 2	< 2		
Spike Level					
Dibutyl Chlorendate		91	88		
Sequence Date			#5-08/27/93		
alpha-BHC		£240.2	1		
beta-BHC		≤2 <0.2			
gamma-BHC		€2<0.2			
delta-BHC		<2 < 0.2			
Heptachlor		<2<0.2			4
Aldrin		€2<0.2	1		
Heptachlor Epoxide		52 < 0.2			
Endosulfan I		£240.2	1		
DDE		52<0.2			
Dieldrin		5240.2	J 42 403	2 J	
Endrin		<2<0.2	3 <2 < 0.	· · *	
Endosulfan II		£2<0.3		^ T	
DDD		\$2<0.2	2 <0.	ر ب <i>ا</i>	
Endrin Aldehyde		₹ 2<0.2	. J	, .T	
DDT		€2 <0.2	1	2 S	
Endosulfan Sulfate		£2 <0.3		2.7	
Endrin Ketone		\$2 < 0.3	27 <12 <0.		
Methoxy Chlor		<105	520° (10	0.2	
Chlordane		<50♂	\ 30	0.3	
Dibutyl Chlorendate		91	88		
Spike Level					
Vol Sequence	#3&4-08/24/93		#	#3&4-08/25/93	
CCI4	<1			<1	
TCA	<1			<1	
Benzene	<1			<1	
TCE	<1			<1	
Toluene	<1			<1	
PCE	<1			<1	
Ethylbenzene	<1			<1	4
Xylenes	<2			<2	
Gasoline	<50 2			550 KIDO 3	5
Spike level					
BFB	88			116	828
					6-14-95
					•

ICF ID	LAY-1B01	LAY-1802
F&BI Number	441	569
Sample Type	water	water
Date Received	8/24/93	8/25/93
% Dry Weight		
Sequence Date		
Leaded Gas		
JP-4		
Lube Oil		
Diesel		
Spike Level		
Unknown Semi-volatile		
Pentacosane		
Sequence Date		
PCB 1221		
PCB 1232		
PCB 1016		
PCB 1242		
PCB 1248		
PCB 1254		
PCB 1260		
Spike Level		
Dibutyl Chlorendate		
Sequence Date		
alpha-BHC		
beta-BHC		
gamma-BHC		
delta-BHC		
Heptachlor		
Aldrin		
Heptachlor Epoxide		
Endosulfan l		
DDE		
Dieldrin		
Endrin		
Endosulfan II		
DDD		
Endrin Aldehyde		
DDT		
Endosulfan Sulfate		
Endrin Ketone		
Methoxy Chlor		
Chlordane		
Dibutyl Chlorendate		
Spike Level	1100 4 50 10 110 1	00.4.00/07/07
Vol Sequence	#3&4-08/24/93 #3	
CCI4	<1	<1
TCA	<1	<1
Benzene	<1	<1
TCE	<1	<1
Toluene	<1	<1
PCE	<1	<1
Ethylbenzene	<1	<1
Xylenes	<2	<2
Gasoline	250 450 J	550 YIW I
Spike level		
BFB	103	102

6-14-82 1528

LAY-TB01

LAY-TB02

ICF ID

APPENDIX G DATA VALIDATION SUMMARIES

ICF KAISER ENGINEERS

ICF KAISER ENGINEERS, INC. 1800 HARRISON STREET P.O. Box 23210 OAKLAND, CALIFORNIA 94612-3430 510/419-6000 FAX 510/419-5355

DATA VALIDATION REPORT

PROGRAM:

Elmendorf AFB RI/FS/Point Lay (ICF Project No. 41096-412-02)

LABORATORY:

Commercial Testing & Engineering Co. (Anchorage, AK)

REVIEWER:

Cynthia Schlag, ICF Kaiser Engineers

ANALYSIS:

Extractable Petroleum Hydrocarbons by USEPA Method 8100M

MATRIX:

Soil

DATE:

April 14, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (Anchorage, AK) received four (4) soil samples for extractable petroleum hydrocarbons (EPH) analyses by modified USEPA Method 8100 on September 7, 1993. The samples were extracted on September 14, 1993 and analyzed for EPH by gas chromatography with flame ionization detection (GC/FID) on September 17, 20 and 21, 1993.

The ICF site identification numbers and corresponding Commercial Testing & Engineering Co. sample identification numbers are listed below.

ICF Site No.	<u>Lab Sample No.</u>
LAY-AOC4-2SD05	93.4692-06
LAY-AOC5-2S08	93.4693-01
LAY-SS06-2SD07	93.4693-13
LAY-SS06-2S12	93.4693-14

There were no QC sample designations included in project documentation.

Soil sample results and quantitation limits were reported by the laboratory with an adjustment for moisture content.

The analytical results with qualifications are presented on modified sample data sheets included in the report appendix. Definitions of data qualifiers are provided in Table 1B. This report was prepared according to the USEPA draft document "National Functional Guidelines for Organic Data Review." (December 1990), modified USEPA SW-846 Method 8100 and the Project Sampling and Analysis Plan.

II. VALIDITY and COMMENTS:

A. <u>Technical Holding Times:</u>

A.1 Technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:

B.1 All QC criteria for the initial calibration were met and the results are considered acceptable.

C. <u>Continuing Calibration</u>:

C.1 All QC criteria for the continuing calibration were met and the results are considered acceptable.

D. <u>Laboratory Blanks</u>:

D.1 The target analytes were not detected in the method blank at concentrations above the Practical Quantitation Limits (PQL) and the results are considered acceptable.

E. Surrogate Recoveries:

E.1 All surrogate recoveries met applicable QC criteria and the results are considered acceptable.

F. Field Blanks:

F.1 There was no field blank designation included in project sample analyses.

G. <u>Laboratory Control Sample Analysis:</u>

G.1 Laboratory control sample QC criteria were met for all "blank spike" analyses and the results are considered acceptable.

H. <u>Laboratory Replicate Analysis</u>:

H.1 No laboratory replicate control sample is included with the project documentation.

I. Field Duplicate Analysis:

1.1 No field duplicate analysis is included with the project documentation.

J. Matrix Spike/Matrix Spike Duplicate Analysis:

J.1 The matrix spike (MS) and matrix spike duplicate (MSD) analyses did not meet the QC criteria as noted below.

Recovery	QC Limits
0%	50-140%
0%	50-140%
1100%	50-140%
2294%	50-140%
	0% 0% 1100%

Although EPH spikes were not recovered for sample number LAY-LF01-S2D13 MS/MSD, the surrogate recoveries were within acceptable limits. According to USEPA guidelines, organic data are not qualified based on MS/MSD recoveries alone. It is the opinion of the reviewer that the above noted recoveries are due to matrix interferences and affect the quality of the data is not known.

K. Quantitation and Identification:

- K.1 The chromatographic pattern of samples LAY-AOC4-2SD05, LAY-SS06-2SD07 and LAY-SS06-2S12 is not consistent with the chromatographic pattern of middle distillate fuel (diesel fuel). It is the opinion of the reviewer that peaks found in the above noted samples are due to the presence of higher molecular weight hydrocarbons. Therefore, the detected results for EPH in these samples are considered as estimated (J) and are usable for limited purposes (see modified sample data sheets).
- K.2 No other problems were observed with analyte quantitation and identification for all project sample analysis.

L. <u>Conclusion</u>:

- L.1 Due to the inconsistency of the chromatographic pattern with the diesel fuel standard, select data are considered as estimates and usable for limited purposes only.
- L.2 All other data are considered valid and usable for all purposes.

ICF KAISER ENGINEERS

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DATA VALIDATION REPORT

PROGRAM:

Elmendorf AFB/Point Lay RI/FS (ICF Project No.41096-412-02)

LABORATORY:

Commercial Testing & Engineering Co. (Anchorage, AK)

REVIEWER:

Cynthia E. Schlag

ANALYSIS:

Volatile Petroleum Hydrocarbons by USEPA Method 8015M

MATRIX:

Soil

DATE:

February 7, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (CT&E) (Anchorage, AK) received four (4) soil samples for Volatile Petroleum Hydrocarbons (VPH) analysis by USEPA Method 8015M (modified) on September 7, 1993. The samples were analyzed for VPH by gas chromatography with flame ionization detection (GC/FID) on September 15 and 18, 1993.

The ICF site identification numbers and corresponding CT&E laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.
LAV ACCA 20D05	02.4602.06
LAY-AOC4-2SD05 LAY-AOC5-2S08	93.4692-06 93.4693-01
LAY-SS06-2SD07	93.4693-13
LAY-SS06-2S12	93.4693-14

There were no QC sample designations included in project documentation.

It should be noted, that all quantitation limits reported by the laboratory for project soil samples were higher than those specified in the Project Sampling and Analysis Plan for USEPA Method 8015M. According to the laboratory, all soil samples were extracted in methanol before analysis as required by State of Alaska guidelines. It is the opinion of the reviewer that the quality of the data was not affected.

The analytical results for project soil samples were reported with an adjustment for moisture content.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared according to the USEPA draft document "National Functional Guidelines for Organic Data Review" (December 1990), USEPA Method 8015M (VPH analysis) and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

- A. <u>Technical Holding Times:</u>
 - A.1 Technical holding time QC criteria were met for all project sample analyses.
- B. Initial Calibration:
 - B.1 All QC criteria for the initial calibration were met and the results are considered acceptable.
- C. <u>Continuing Calibrations:</u>
 - C.1 All QC criteria for the continuing calibration were met and the results are considered acceptable.
- D. <u>Laboratory Blanks</u>:
 - D.1 The target analyte was not detected in the method blanks at a concentration above the practical quantitation limit (PQL) and the results are considered acceptable.
- E. Field Blanks:
 - E.1 No field blank analysis is included in project documentation.
- F. <u>Laboratory Control Sample Analysis:</u>
 - F.1 The laboratory control sample QC criteria were met for all "blank spike" analyses and the results are considered acceptable.
- G. Field Duplicate Analysis:
 - G.1 No field duplicate analysis is included in the project documentation.
- H. Surrogate Recoveries:
 - H.1 All surrogate recoveries met applicable QC criteria and the results are considered acceptable.
- I. Matrix Spike/Matrix Spike Duplicate Analyses:
 - I.1 The matrix spike (MS) and matrix spike duplicate (MSD) analyses associated with these samples met all applicable QC criteria and the results are considered acceptable.
- J. Internal Standards:
 - J.1 Internal standard areas for all sample analyses were within specified QC criteria and the results are considered acceptable.
- K. Quantitation and Identification:
 - K.1 No other problems were observed with sample quantitation and identification in project sample analysis.
- L. Conclusion:
 - L.1 All data are considered valid and usable for all purposes.

ICF KAISER ENGINEERS, INC. 1800 HARRISON STREET P.O. Box 23210 OAKLAND, CALIFORNIA 94612-3430 510/419-6000 FAX 510/419-5355

DATA VALIDATION REPORT

PROGRAM: LABORATORY: Dewline/Point Lay RI/FS (ICF Project No.41096-412-02) Commercial Testing & Engineering Co. (Anchorage, AK)

REVIEWER:

Cynthia Schlag, ICF Kaiser Engineers

ANALYSIS:

Volatile Organic Compounds by USEPA Method 8260

MATRIX:

Water and Soil

DATE:

April 15, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (Anchorage, AK) received ten (10) soils and twelve (12) water samples for volatile organic compounds (VOC) analyses by USEPA Method 8260 on August 23, 24, and September 7, 1993. The samples were analyzed for VOCs by gas chromatography/mass spectrometry (GC/MS) on September 2, 3, 5, 13, 20, 28, and October 1, 1993.

The ICF site identification numbers and corresponding Commercial Testing & Engineering Co. sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	<u>Matrix</u>
LAY-AOC5-SD01	93.4327-01	Soil
LAY-AOC5-S06	93.4327-02	Soil
LAY-BKGD-SD01	93.4327-05	Soil
LAY-BKGD-S01	93.4327-06	Soil
LAY-TB01	93.4328-01	Water
LAY-EB01	93.4328-02	Water
LAY-BKGD-SW01	93.4328-05	Water
LAY-SS06-S03	93.4354-04	Soil
LAY-LF01-SD04	93.4354-06	Soil
LAY-TB02	93.4356-01	Water
LAY-EB02	93.4356-02	Water
LAY-AB01	93.4356-05	Water
LAY-AOC5-SW01	93.4356-06	Water
LAY-LF01-SW04	93.4356-10	Water
LAY-LF01-SW08	93.4356-11	Water
LAY-SS06-SW02	93.4356-12	Water
LAY-AOC4-2SD05	93.4692-06	Soil
LAY-TB03	93.4692-16	Water
LAY-EB03	93.4692-17	Water
LAY-AOC5-2S08	93.4693-01	Soil

LAY-SS06-2SD07	93.4693-13	Soil
LAY-SS06-2S12	93.4693-14	Soil

The following QC sample designations were included in project documentation: sample numbers LAY-TB01, LAY-TB02 and LAY-TB03 were designated as "trip blanks;" sample numbers LAY-EB01, LAY-EB02 and LAY-EB03 were designated as "equipment blanks;" sample number LAY-AB01 was designated as an "ambient blank;" sample numbers LAY-LF01-SW04 and LAY-LF01-SW08 were designated as a "field duplicate pair."

Soil sample results and quantitation limits were reported by the laboratory with an adjustment for moisture content.

Laboratory reports for matrix spike (MS) and matrix spike duplicate (MSD) analyses associated with some project samples were not included with the data package. Therefore, the corresponding ICF sample numbers could not be determined and the laboratory sample numbers were referenced in comment K.1 instead.

It should be noted, that all quantitation limits reported by the laboratory for project soil samples were higher than those specified in the Project Sampling and Analysis Plan for USEPA Method 8260. According to the laboratory, all soil samples were extracted in methanol before analysis, as required by State of Alaska guidelines. It is the opinion of the reviewer that the quality of the data was not affected.

The analytical results with qualifications are presented on modified sample data sheets included in the report appendix. Definitions of data qualifiers are provided in Table 1B. This report was prepared according to the USEPA draft document "National Functional Guidelines for Organic Data Review" (December 1990), USEPA SW-846 Method 8260, and the Project Sampling and Analysis Plan.

II. VALIDITY and COMMENTS:

A. <u>Technical Holding Times:</u>

A.1 Sample numbers LAY-SS06-S03, LAY-LF01-SD04, LAY-A0C4-2SD05, LAY-AOC5-2S08, LAY-SS06-2SD07, and LAY-SS06-2S12 exceeded the technical holding time criteria of 14 days as noted below.

Sample No.	Date Collected	Date Analyzed	Days Exceeded
LAY-AOC5-2SD08	09/07/93	10/01/93	10
LAY-SS06-2SD07	09/07/93	10/01/93	10
LAY-SS06-2S12	09/07/93	10/01/93	10
LAY-AOC4-2SD05	09/07/93	09/28/93	7
LAY-SS06-S03	08/24/93	09/13/93	6
LAY-LF01-SD04	08/24/93	09/13/93	6

The quantitation limits and detected results for the above noted samples are considered as estimates (J) and usable for limited purposes only (see modified sample data sheets).

A.2 Technical holding time QC criteria were met for all other project sample analyses.

B. GC/MS Instrument Performance Check:

B.1 All QC criteria for the bromofluorobenzene (BFB) tunes were met and the results are considered acceptable.

C. Initial Calibration:

- C.1 Due to no relative response factors (RRFs) for the initial calibration dated 09/20/93, the following quantitation limits for the analytes noted below are considered rejected (R) and unusable for any purpose (see modified sample data sheets).
- 1,2-dibromo-3-chloropropane, 1,2,4-trichlrobenzene, 1,2,3-trichlorobenzene, napthalene, and hexachlorobutadiene in sample numbers LAY-TB03 and LAY-EB03
- C.2 All other QC criteria for the initial calibration were met and the results are considered acceptable.

D. Continuing Calibration:

D.1 The percent differences (%Ds) in the continuing calibrations exceeded the $<\pm25\%$ QC validation criteria. The detected results and quantitation limits for the analytes listed in Table A are considered estimated (J) and usable for limited purposes only (see modified sample data sheets and Table A).

%Ds exceeding the $<\underline{+}$ 25% QC validation criteria were observed for several analytes in the continuing calibrations performed on September 20 and 28, 1993. These deviations are not expected to affect the quality of the results, except for those listed in Table A.

E. <u>Laboratory Blanks</u>:

- E.1 Chloromethane was detected in the method blank at a concentration of 1.03 mg/L. Due to method blank contamination, the results reported for chloromethane in sample numbers LAY-TB03 and LAY-EB03 are considered as nondetected (U) (see modified sample data sheets).
- E.1 No other target analytes were detected in the method blank at concentrations above the Practical Quantitation Limits (PQLs) and the results are considered acceptable.

F. Surrogate Recoveries:

F.1 All surrogate recoveries met applicable QC criteria and the results are considered acceptable.

G. Field Blanks:

G.1 The following target analytes were detected in the field blanks listed below at concentrations above the PQL:

Sample No.	<u>Analyte</u>	Concentration
LAY-TB03	cis-1,2-dichloroethene	0.0015 mg/L
LAY-TB03	methylene chloride	0.0028 mg/L
LAY-TB03	chloromethane	0.0031 mg/L
LAY-EB03	cis-1,2-dichloroethene	0.0046 mg/L
LAY-EB03	methylene chloride	0.0034 mg/L
LAY-EB03	chloromethane	0.0031 mg/L
LAY-TB02	bromodichloromethane	0.0027 mg/L
LAY-TB02	bromoform	0.0042 mg/L
LAY-TB02	chloroform	0.0025 mg/L
LAY-TB02	dibromochloromethane	0.0040 mg/L
LAY-TB02	methylene chloride	0.0120 mg/L
LAY-EB02	methylene chloride	0.0023 mg/L
LAY-AB01	methylene chloride	0.0031 mg/L

Due to equipment blank contamination, the results reported for methylene chloride in sample numbers LAY-LF01-SW04 and LAY-LF01-SW08 are considered as nondetected (U) (see modified sample data sheets).

G.2 No other target analytes were detected in the field blanks at concentrations above the PQLs and the results are considered acceptable.

H. Laboratory Control Sample Analysis:

H.1 Laboratory control sample QC criteria were met for all "blank spike" analyses and the results are considered acceptable.

I. <u>Laboratory Replicate Analysis:</u>

I.1 No laboratory replicate analysis was included with the project documentation.

J. Field Duplicate Analysis:

J.1 A QC limit for precision of \leq 20%, as measured by the Relative Percent Difference (RPD) between sample values, was specified for field duplicate comparability.

Sample numbers LAY-LF01-SW04 and LAY-LF01-SW08 were utilized for the field duplicate analysis. The RPD for napthalene is 100%, exceeding the acceptable QC limits. Due to the substantial difference in the napthalene values, the detected result for napthalene in sample number LAY-LF01-SW08 and the quantitation limit in sample number LAY-LF01-SW04 are considered estimated (J) and usable for limited purposes only (see modified sample data sheets).

K. <u>Matrix Spike/Matrix Spike Duplicate Analysis</u>:

K.1 The recoveries of 1,1-dichloroethane in the matrix spike (MS) and matrix spike duplicate (MSD) analyses associated with all the soil samples did not meet the laboratory established QC limits as noted below.

Sample No.	% Recovery	QC Limits
LAY-LF01-2SD13 MS	20	80-120%
LAY-LF01-2SD13 MSD	17	80-120%
LAY-LF01-SD04 MS	64	80-120%
LAY-LF01-SD04 MSD	66	80-120%
93.4727-02	21	80-120%
93.4727-03	24	80-120%

According to USEPA data validation guidelines, organic data are not qualified based on MS/MSD QC outliers alone. It is the opinion of the reviewer that the low recoveries in these samples are due to sample matrix interferences, and the affect on the quality of the data is not known.

K.2 The laboratory inappropriately used an equipment blank for MS/MSD analyses associated with sample numbers LAY-TB02, LAY-EB02, LAY-AB01, LAY-AOC5-SW01, LAY-LF01-SW08, LAY-SS06-SW02, and LAY-LF01-SW04. Therefore, the accuracy and precision for the project samples based on a project sample matrix cannot be determined.

L. Internal Standards:

L.1 The internal standard areas (I.S.A.) for sample number LAY-AOC5-SD01 did not meet the QC criteria, as noted below.

LAY-AOC5-SD01 I.S.A.	I.S.A. Acceptable Range
50781	65949-263796
46708	57047-228188
33095	35625-142498

Due to low internal standard areas for the above noted sample, all results and quantitation limits for above noted sample are considered estimated (J) and usable for limited purposes only (see modified sample data sheets).

L.2 Internal standard areas for all other sample analyses were within specified QC criteria and the results are considered acceptable.

M. Quantitation and Identification:

M.1 No problems were observed with analyte quantitation and identification in project sample analyses.

N. Conclusion:

- N.1 Due to deficiencies in the initial calibration, select data are considered rejected and unusable for any purpose.
- N.2 Due to deficiencies in the continuing calibrations, field duplicate analyses, internal standard areas, and exceeded technical holding times, select data are considered estimated and usable for limited purposes only.

- ${\sf N.3}$ Due to method and field blank contamination, select data are considered non-detected.
- N.4 All other data are considered valid and usable for all purposes.

TABLE A CALIBRATIONS OUTSIDE %D CRITERIA			
Date	Compound	%D	Samples
Continuing Calibration - September 20, 1993	chloromethane bromofluorobenzene bromobenzene 1,2,3-trichloropropane n-propylbenzene 2-chlorotoluene 4-chlorotoluene 1,3,5-trimethylbenzene	-99.6 39.3 26.8 28.2 30.0 27.7 29.4 26.6	blank(aq) LAY-TB03 LAY-EB03
Continuing Calibration - September 28, 1993	chloromethane vinyl chloride chloroethane	29.5 29.0 26.2	LAY-AOC4-2SD05

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DATA VALIDATION REPORT

PROGRAM: LABORATORY: Dewline/RI/FS/Point Lay (ICF Project No. 41096-412-02) Commercial Testing & Engineering Co. (Anchorage, AK)

REVIEWER:

Cynthia Schlag, ICF Kaiser Engineers

ANALYSIS:

Semivolatile Organic Compounds by USEPA Method 8270

MATRIX: DATE: Soil and Water April 15, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (Anchorage, AK) received nine (9) soil samples and five (5) water samples for semivolatile organic compound (SVOC) analyses by USEPA Method 8270 on August 23, 24, and September 7, 1993. The water samples were extracted on August 30, and September 1, 1993 and analyzed for SVOCs by gas chromatography/mass spectrometry (GC/MS) on September 4 through 7, 1993. The soil samples were extracted on September 6 and 17, 1993 and analyzed for SVOCs by GC/MS on September 22, 30, and October 1 and 26, 1993.

The ICF site identification numbers and corresponding Commercial Testing & Engineering Co. sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	Matrix
LAY-AOC5-SD01 LAY-AOC5-S06 LAY-BKGD-SD01 LAY-BKGD-S01 LAY-BKDG-SW01 LAY-AOC5-SW01 LAY-SS06-S03 LAY-LF01-SD04 LAY-SS06-SW02 LAY-LF01-SW04	Lab Sample No. 93.4327-01 93.4327-02 93.4327-05 93.4327-06 93.4329-01 93.4354-01 93.4354-04 93.4354-10 93.4358-01	Matrix Soil Soil Soil Water Water Soil Water Soil Water Soil
LAY-LF01-SW08 LAY-AOC5-2S08 LAY-SS06-2SD07 LAY-SS06-2S12	93.4358-04 93.4693-01 93.4693-13 93.4693-14	Water Soil Soil Soil

The following QC sample designations were included in project documentation: sample numbers LAY-LF01-SW04 and LAY-LF01-SW08 were designated as a "field duplicate pair."

Soil sample results and quantitation limits were reported by the laboratory with an adjustment for moisture content.

Sample number LAY-A0C5-2S08 was not analyzed by the laboratory because the sample was not recovered during extraction. Therefore, the results for this sample were not submitted and were not validated.

Laboratory reports for matrix spike (MS) and matrix spike duplicate (MSD) analyses associated with some project samples were not included with the data package. Therefore, the corresponding ICF sample numbers could not be determined and the laboratory sample numbers were referenced in comments F.2 and K.1 instead.

The analytical results with qualifications are presented on modified sample data sheets included in the report appendix. Definitions of data qualifiers are provided in Table 1B. This report was prepared according to the USEPA draft document "National Functional Guidelines for Organic Data Review" (December 1990), USEPA SW-846 Method 8270, and the Project Sampling and Analysis Plan.

II. VALIDITY and COMMENTS:

A. Technical Holding Times:

- A.1 Sample numbers LAY-LF01-SW04 and LAY-LF01-SW08 exceeded the extraction technical holding time criteria of 7 days by one day and it is the opinion of the reviewer that this will not affect data quality.
- A.2 Technical holding time QC criteria were met for all other project sample analyses.

B. GC/MS Instrument Performance Check:

B.1 All QC criteria for the decafluorotriphenylphosphine (DFTPP) tunes were met and the results are considered acceptable.

C. Initial Calibration:

C.1 All QC criteria for the initial calibration were met and the results are considered acceptable.

D. <u>Continuing Calibration</u>:

D.1 The percent differences (%Ds) in the continuing calibrations exceeded the $\leq \pm 25\%$ QC validation criteria for several analytes in the continuing calibrations performed on August 30, September 4, 6, and October 23 and 26, 1993. The detected results and quantitation limits for the analytes listed on Table A are considered estimated (J) and usable for limited purposes only (see modified sample data sheets and Table A).

E. Laboratory Blanks:

E.1 Target analyte di-n-butylphthalate was detected in the soil method blanks listed at concentrations above the Practical Quantitation Limit (PQL):

Date extracted	<u>Analyte</u>	Concentration
09/06/93	di-n-butylphthalate	0.20 mg/Kg
09/17/93	di-n-butylphthalate	2.31 mg/Kg

Due to method blank contamination, the result reported for di-n-butylphthalate in sample numbers LAY-LF01-SD04, LAY-SS06-2SD07, and LAY-SS06-2S12 are considered non-detected (U) (see modified sample data sheets).

- E.2 Due to laboratory contamination, the result reported for bis(2-ethylhexyl)phthalate in sample number LAY-LF01-SD04 is considered non-detected (U) (see modified sample data sheets). Although not detected in the laboratory method blank, bis(2-ethylhexyl)phthalate has historically been recognized as a common laboratory contaminant. It is the opinion of the reviewer that the bis(2-ethylhexyl)phthalate reported in the sample noted above is an artifact.
- E.3 No other target analytes were detected in the method blanks at concentrations above the PQL and the results are considered acceptable.

F. <u>Surrogate Recoveries</u>:

- F.1 All surrogate recoveries for the laboratory soil method blank extracted on 09/17/93 were below the 10% QC validation criteria. Therefore, the quantitation limits for all target analytes are considered rejected (R) and unusable for any purpose (see modified sample data sheets).
- F.2 The following percent surrogate recoveries, listed below, for sample numbers 93.4258-02 MS, 93.4728-02 MS, 93.4728-03 MSD LAY-AOC5-SD01, LAY-AOC5-S06, LAY-AOC5-S06 MS and LAY-AOC5-S06 MSD were outside the method QC limits.

Sample No.	<u>Analyte</u>	Recovery	QC criteria
93.4258-02 MS	2-fluorobiphenyl	37%	43-116%
93.4258-02 MS	2-fluorophenol	19%	21-100%
93.4728-02 MS	phenol-d6	114%	24-113%
93.4728-03 MSD	nitrobenzene-d5	144%	23-120%
93.4728-02 MS	2-fluorobiphenyl	190%	30-115%
93.4728-03 MSD	2-fluorobiphenyl	181%	30-115%
93.4728-02 MS	2,4,6-tribromophenol	140%	19-122%
93.4728-03 MSD	2,4,6-tribromophenol	126%	19-122%
93.4728-02 MS	terphenyl-d14	179%	18-137%
93.4728-03 MSD	terphenyl-d14	163%	18-137%
LAY-AOC5-SD01	2,4,6-tribromophenol	124%	19-122%
LAY-AOC5-S06	2,4,6-tribromophenol	125%	19-122%
LAY-AOC5-S06 MS	2,4,6-tribromophenol	127%	19-122%
LAY-AOC5-S06 MSD	2-fluorophenol	15%	25-121%

Due to the above listed surrogate recovery problems, the following detected results are considered estimated (J) and usable for limited purposes only (see modified sample data sheets):

- di-n-butylphthalate in sample numbers LAY-SS06-2SD07 and LAY-SS06-2S12
- F.3 All other surrogate recoveries met applicable QC criteria and the results are considered acceptable.

G. Field Blanks:

G.1 No field blank analysis were included with the project documentation.

H. Laboratory Control Sample Analysis:

H.1 Laboratory control sample QC criteria were met for all "blank spike" analyses and the results are considered acceptable.

I. Laboratory Replicate Analysis:

1.1 No laboratory replicate analysis is included with the project documentation.

J. Field Duplicate Analysis:

J.1 A QC limits for precision of ≤20%, as measured by the Relative Percent Difference (RPD) between sample values, was specified for field duplicate comparability.

Sample number LAY-LF01-SW04 and LAY-LF01-SW08 were utilized for the field duplicate analysis. The results of the field duplicate analysis met all applicable QC criteria and the results are considered acceptable.

K. Matrix Spike/Matrix Spike Duplicate Analysis:

K.1 The MS/MSD recoveries in sample numbers 93.4258-02 MS, 93.4258-03 MSD, 93.4728-02 MS, 93.4728-03 MSD, LAY-AOC5-S06 MS and LAY-AOC5-S06 MSD did not meet the QC criteria as noted below.

Sample No.	Compound	Recovery	QC Limits
93.4258-02 MS	1,2,4-trichlorobenzene	39%	52-115%
93.4258-02 MS	acenapthene	45%	23-134%
93.4258-02 MS	pentachlorophenol	12%	14-176%
93.4258-03 MSD	pentachlorophenol	11%	14-176%
93.4728-02 MS	di-n-butylphthalate	313%	1 -118%
93.4728-03 MSD	di-n-butylphthalate	289%	1 -118%
LAY-AOC5-S06 MS	2,4-dinitrotoluene	99%	28- 89%
LAY-AOC5-S06 MS	pentachlorophenol	143%	17-109%
LAY-AOC5-S06 MSD	2-chlorophenol	22%	25-102%
LAY-AOC5-S06 MSD	1,4-dichlorobenzene	17%	28-104%
LAY-AOC5-S06 MSD	n-nitroso-di-n-propylamine	31%	41-126%
LAY-AOC5-S06 MSD	1,2,4-trichlorobenzene	28%	38-107%

According to USEPA guidelines, organic data are not qualified based on MS/MSD recoveries alone. It is the opinion of the reviewer that the recoveries in these samples are due to sample matrix interferences and the affect on the quality of the data is not known.

K.2 All other MS and MSD analyses met the QC criteria and are considered acceptable.

L. <u>Internal Standards</u>:

L.1 Internal standard areas for all analyses met applicable QC criteria and the results are considered acceptable.

M. Quantitation and Identification:

M.1 No problems were observed with analyte quantitation and identification in project sample analyses.

N. Conclusion:

- N.1 Due to the above noted low surrogate recoveries, select data are considered rejected and unusable for any purposes.
- N.2 Due to the above noted deficiencies in continuing calibration performance and surrogate recoveries, select data are considered as estimates and usable for limited purposes only.
- N.3 Due to the above noted laboratory blank contamination, select data are considered non-detected.
- N.4 All other data are considered valid and usable for all purposes.

TABLE A CALIBRATIONS OUTSIDE %D CRITERIA			
Date	Compound	%D	Samples
Continuing Calibration - August 30, 1993	3,3'-dichlorobenzidine	40.6	blank(aq)
Continuing Calibration - September 4, 1993	3,3'-dichlorobenzidine	29.5	LAY-BKGD-SW01
Continuing Calibration - September 6, 1993	hexachlorocyclopentadiene 3,3'-dichlorobenzidine	26.7 29.4	blank(aq) LAY-A0C5-SW01
Continuing Calibration - October 23, 1993	benzo(b)fluoranthene benzo(a)pyrene dibenz(a,h)anthracene	27.8 26.7 27.2	blank(soil)
Continuing Calibration - October 26, 1993	benzoic acid hexachlorobenzene pentachlorophenol dibenz(a,h)anthracene benzo(g,h,i)perylene	28.5 27.5 28.2 28.6 28.6	LAY-SS06-2SD07 LAY-SS06-2S12

ICF KAISER ENGINEERS, INC. 1800 HARRISON STREET P.O. Box 23210 OAKLAND, CALIFORNIA 94612-3430 510/419-6000

DATA VALIDATION REPORT

PROGRAM:

Elmendorf AFB/Point Lay RI/FS (ICF Project No. 41096-412-02)

LABORATORY: Commercial Testing & Engineering Co. (Anchorage, AK)

REVIEWER:

Sharon Lin, ICF Kaiser Engineers, Inc.

ANALYSIS:

Total Organic Carbon by USEPA Method 9060

MATRIX:

Water

DATE:

February 15, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (CT&E) (Anchorage, AK) received one (1) water sample for Total Organic Carbon (TOC) analysis by USEPA Method 9060 on August 25, 1993. The sample was analyzed for TOC on September 7, 1993.

The ICF site identification number and corresponding CT&E laboratory sample identification number are listed below.

ICF Site No.

Lab Sample No.

LAY-BKGD-SW01

4328-5

The analytical result is presented on the sample data sheet submitted by the laboratory (definitions of the data qualifiers are listed in Table 1B). This report was prepared in accordance with the USEPA draft document "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analysis," October 1989, USEPA Method 9060 and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

Technical Holding Times: Α.

> All technical holding time criteria were met for project sample analyses.

В. <u>Initial Calibrations:</u>

> Initial calibration QC criteria were met for all project sample analyses and the results are considered acceptable.

C. <u>Continuing Calibrations</u>:

C.1 Continuing calibration QC criteria were met for all project sample analyses and the results are considered acceptable.

D. <u>Laboratory Blanks:</u>

D.1 TOC was not detected in the method blank at a concentration above the Practical Quantitation Limit (PQL) and the results are considered acceptable.

E. Field Blanks:

E.1 No field blanks were included in the project documentation.

F. <u>Laboratory Control Sample (LCS) Analysis:</u>

F.1 The laboratory control sample QC criteria were met for all "blank spike" analyses and the results are considered acceptable.

G. <u>Laboratory Replicate Analysis:</u>

G.1 Laboratory replicate analyses submitted with project data met all applicable QC criteria for precision as measured by Relative Percent Difference (RPD) and the results are considered acceptable.

H. Field Duplicate Analysis:

H.1 No field duplicates were included in the project documentation.

I. Matrix Spike:

I.1 The matrix spike (MS) recovery for the project sample was 72%, falling below the advisory QC criteria of 75-125%. It is the opinion of the reviewer that the above noted deviation is due to matrix interferences and this should be noted.

J. Quantitation:

J.1 No problems were encountered with sample quantitation and the results are considered acceptable.

K. <u>Conclusion:</u>

K.1 All data are considered valid and usable for all purposes.

ICF KAISER ENGINEERS, INC. 1800 HARRISON STREET P.O. Box 23210 OAKLAND, CALIFORNIA 94612-3430 510/419-6000

DATA VALIDATION REPORT

Elmendorf AFB/Point Lay RI/FS (ICF Project No. 41096-412-02)

LABORATORY: Commercial Testing & Engineering Co. & Twiss Analytical

(Anchorage, AK)

REVIEWER:

Sharon Lin, ICF Kaiser Engineers, Inc.

ANALYSIS:

Total Organic Carbon by USEPA Method 9060

MATRIX:

DATE:

February 15, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (CT&E) (Anchorage, AK) received two (2) soil samples for Total Organic Carbon (TOC) analysis by USEPA Method 9060 on August 25, 1993. The samples were analyzed by Twiss Analytical for TOC on September 20, 1993.

The ICF site identification numbers and corresponding CT&E laboratory sample identification numbers are listed below.

ICF Site No.	<u>Lab Sample No.</u>
LAY-BKGD-SD01	4327-5
LAY-BKGD-S01	4327-6

The analytical results are presented on the sample data sheets submitted by the laboratory (definitions of the data qualifiers are listed in Table 1B). This report was prepared in accordance with the USEPA draft document "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analysis," October 1989, USEPA Method 9060 and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

Technical Holding Times:

All technical holding time criteria were met for project sample analyses.

B. Initial Calibrations:

B.1 The laboratory did not use a multi-level calibration standards to quantitate results for the soil samples, as specified in the USEPA Method 9060. However, the single point calibration standard used was within a reasonable range for accurate quantitation. Therefore, it is the opinion of the reviewer that the quality of the data is not affected and the results are considered acceptable.

C. <u>Laboratory Blanks:</u>

C.1 TOC was not detected in the method blank at a concentration above the Practical Quantitation Limit (PQL) and the results are considered acceptable.

D. Field Blanks:

D.1 No field blanks were included in the project documentation.

E. <u>Laboratory Control Sample (LCS) Analysis:</u>

E.1 The laboratory control sample QC criteria were met for all "blank spike" analyses and the results are considered acceptable.

F. Laboratory Replicate Analysis:

F.1 Laboratory replicate analyses submitted with project data met all applicable QC criteria for precision as measured by Relative Percent Difference (RPD) and the results are considered acceptable.

G. Field Duplicate Analysis:

G.1 No field duplicates were included in the project documentation.

H. Matrix Spike:

H.1 No matrix spike (MS) recovery analysis was required for this method.

I. Quantitation:

I.1 Although a single point calibration standard was used to quantitate sample results, the quality of the data are not affected and the results are considered acceptable.

K. Conclusion:

K.1 All data are considered valid and usable for all purposes.

ICF Kaiser Engineers, Inc. 1800 Harrison Street P.O. Box 23210 Oakland, California 94612-3430 510/419-6000

DATA VALIDATION REPORT

PROGRAM:

Elmendorf AFB/Point Lav RI/FS (ICF Project No. 41096-412-02)

LABORATORY:

Commercial Testing & Engineering Co. (Anchorage, AK)

REVIEWER:

Cynthia Schlag

ANALYSIS:

Total Organic Carbon by USEPA Method 9060

MATRIX:

Water and Soil

DATE: February 15, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (CT&E) (Anchorage, AK) received three (3) water samples and one (1) soil sample for Total Organic Carbon (TOC) analysis by USEPA Method 9060 on August 24, 1993. The water samples were analyzed by CT&E and the soil sample was analyzed by Twiss Analytical for TOC on September 7 and 21, 1993.

The ICF site identification numbers and corresponding CT&E laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	<u>Matrix</u>
LAY-AOC5-SW01	93.4354-01	Water
LAT-LF01-SD04	93.4354-06	Soil
LAY-LF01-SW04	93.4358-01	Water
LAY-LF01-SW08	93.4358-06	Water

The following QC sample designation was included in project documentation: sample numbers LAY-LF01-SW04 and LAY-LF01-SW08 were designated as a "field duplicate pair."

Soil sample results and quantitation limits were reported by the laboratory with an adjustment for moisture content.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analysis" (October 1989), USEPA Method 9060 and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:

A.1 Technical holding time QC criteria were met for all project samples.

B. <u>Initial Calibrations:</u>

- B.1 The laboratory did not use multi-level calibration standards to quantitate values for the soil samples, as specified by the method. However, the single-point calibration standard used was within a reasonable range for accurate quantitation. Therefore, it is the opinion of the reviewer that the quality of the data is not affected and the results are considered acceptable.
- B.2 All initial calibration criteria were met for all project water sample analyses and the results are considered acceptable.

C. Laboratory Blanks:

C.1 The target analyte was not detected in the method blanks at a concentration above the practical quantitation limit (PQL) and the results are considered acceptable.

D. Field Blanks:

D.1 The target analyte was not detected in the equipment blank at a concentration above the PQL and the results are considered acceptable.

E. Laboratory Control Sample Analysis:

E.1 The laboratory control sample QC criteria were met for all "blank spike" analyses and the results are considered acceptable.

F. <u>Laboratory Replicate Analysis:</u>

F.1 No laboratory replicate analysis is included with project documentation.

G. Field Duplicate Analysis:

G.1 A QC limit for precision of \leq 20%, as measured by the Relative Percent Difference (RPD) between sample values, was specified for field duplicate comparability.

Sample numbers LAY-LF01-SW04 and LAY-LF01-SW08 were utilized for the field duplicate analysis. The results of the field duplicate analysis met all applicable QC criteria and the results are considered acceptable.

H. Matrix Spike:

- H.1 The water matrix spike recovery met all applicable QC criteria and the results are considered acceptable.
- H.2 No soil matrix spike analysis is included in project documentation, therefore, the quality of the data cannot be determined.

I. Quantitation:

- I.1 Although a single-point calibration standard was used to quantitate sample results, the quality of the data are not affected and the results are considered acceptable.
- I.2 No problems were encountered with sample quantitation and the results are considered acceptable.

J.

Conclusion: J.1 All d All data are considered valid and usable for all purposes.

ICF Kaiser Engineers, Inc. 1800 Harrison Street P.O. Box 23210 OAKLAND, CALIFORNIA 94612-3430 510/419-6000

DATA VALIDATION REPORT

PROGRAM: Elmendorf AFB/Point Lay RI/FS (ICF Project No. 41096-412-02)

LABORATORY: Commercial Testing & Engineering Co. (Anchorage, AK)

REVIEWER: Sharon Lin, ICF Kaiser Engineers, Inc.

ANALYSIS: Total Dissolved Solids by USEPA Method 160.1

MATRIX: Water

DATE: February 2, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (CT&E) (Anchorage, AK) received one (1) water sample for Total Dissolved Solids (TDS) analysis by USEPA Method 160.1 on August 26, 1993. The sample was analyzed for TDS on September 2, 1993.

The ICF site identification number and corresponding CT&E laboratory sample identification number are listed below.

ICF Site No.

<u>Lab Sample No.</u>

LAY-AOC5-SW01

4354-1

The analytical result with qualifications is presented on the sample data sheet submitted by the laboratory. Definitions of data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analysis," October 1989, USEPA Method 160.1 and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. <u>Technical Holding Times:</u>

A.1 The project sample was collected on August 24, 1993 and analyzed for TDS on September 2, 1993, exceeding the technical holding time QC criteria of seven (7) days by two (2) days. Therefore, the detected sample result in the above noted sample is considered an estimate (J) and usable for limited purposes only (see modified sample data sheet)

B. <u>Calibration</u>:

- B.1 The percent recovery for the calibration verification standard (CVS) was 118%, marginally exceeding the advisory QC criteria of 83-117%. It is the opinion of the reviewer that the above noted deviation will not affect the quality of the data.
- B.2 All other applicable QC criteria were met for sample calibration analyses and the results are considered acceptable.

C. <u>Laboratory Blanks:</u>

C.1 TDS was not detected in the method blank associated with the sample at a concentration above the Practical Quantitation Limit (PQL) and the results are considered acceptable.

D. Field Blanks:

D.1 There were no field blank analyses associated with the project sample.

E. <u>Laboratory Replicate Analyses:</u>

E.1 Laboratory replicate analyses submitted with project data met all applicable QC criteria for precision as measured by Relative Percent Difference (RPD) and the results are considered acceptable.

F. Field Duplicate Analysis:

F.1 There were no field duplicate analyses associated with the project sample.

G. Quantitation:

G.1 No problems were encountered with sample quantitation.

H. Conclusion:

H.1 Due to the exceeded holding time, the sample result is considered estimated and usable for limited purposes only.

ICF KAISER ENGINEERS, INC. 1800 HARRISON STREET P.O. Box 23210 OAKLAND, CALIFORNIA 94612-3430 510/419-6000

DATA VALIDATION REPORT

PROGRAM:

Elmendorf AFB/Point Lay RI/FS (ICF Project No. 41096-412-02)

LABORATORY: Commercial Testing & Engineering Co. (Anchorage, AK)

REVIEWER:

Sharon Lin, ICF Kaiser Engineers, Inc.

ANALYSIS:

Total Dissolved Solids by USEPA Method 160.1

MATRIX:

Water

DATE:

February 15, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (CT&E) (Anchorage, AK) received one (1) water sample for Total Dissolved Solids (TDS) analysis by USEPA Method 160.1 on August 26, 1993. The sample was analyzed for TDS on September 2, 1993.

The ICF site identification number and corresponding CT&E laboratory sample identification number are listed below.

ICF Site No.

Lab Sample No.

LAY-LF01-SW08

4358-4

The analytical result with qualifications is presented on the sample data sheet submitted by the laboratory. Definitions of data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analysis," October 1989, USEPA Method 160.1 and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

Technical Holding Times: Α.

The project sample was collected on August 24, 1993 and analyzed for TDS on September 2, 1993, exceeding the technical holding time QC criteria of seven (7) days by two (2) days. Therefore, the detected sample result in the above noted sample is considered an estimate (J) and usable for limited purposes only (see modified sample data sheet).

- B. Calibration:
 - B.1 All applicable QC criteria were met for sample calibration analyses and the results are considered acceptable.
- C. <u>Laboratory Blanks:</u>
 - C.1 TDS was not detected in the method blank associated with the sample at a concentration above the Practical Quantitation Limit (PQL) and the results are considered acceptable.
- D. <u>Field Blanks</u>:
 - D.1 There were no field blank analyses associated with the project sample.
- E. <u>Laboratory replicate Analyses:</u>
 - E.1 Laboratory replicate analyses submitted with project data met all applicable QC criteria for precision as measured by Relative Percent Difference (RPD) and the results are considered acceptable.
- F. Field Duplicate Analysis:
 - F.1 There were no field duplicate analyses associated with the project sample.
- G. Quantitation:
 - G.1 No problems were encountered with sample quantitation.
- H. Conclusion:
 - H.1 Due to the exceeded holding time, the sample result is considered an estimate and usable for limited purposes only.

ICF KAISER ENGINEERS, INC. 1800 HARRISON STREET P.O. Box 23210 OAKLAND, CALIFORNIA 94612-3430 510/419-6000 FAX 510/419-5355

DATA VALIDATION REPORT

PROGRAM:

Elmendorf AFB/Point Lay RI/FS (ICF Project No. 41096-412-02)

LABORATORY: Commercial Testing & Engineering Co. (Anchorage, AK)

REVIEWER:

Sharon Lin, ICF Kaiser Engineers, Inc.

ANALYSIS:

Total Suspended Solids by USEPA Method 160.2

MATRIX:

Water

DATE:

February 3, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (CT&E) (Anchorage, AK) received one (1) water sample for Total Suspended Solids (TSS) analysis by USEPA Method 160.2 on August 26, 1993. The sample was analyzed for TSS on August 31, 1993.

The ICF site identification number and corresponding CT&E laboratory sample identification number are listed below.

ICF Site No.

Lab Sample No.

LAY-AOC5-SW01

4354-1

The analytical result is presented on the sample data sheet submitted by the laboratory (definitions of data qualifiers are listed in Table 1B). This report was prepared in accordance with the USEPA draft document "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analysis," October 1989, USEPA Method 160.2 and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

Technical Holding Times: Α.

All technical holding time QC criteria were met for project sample analyses.

В. Calibration:

Method calibration is not a requirement for USEPA Method B.1 160.2.

C. <u>Laboratory Blanks</u>:

C.1 TSS was not detected in the method blank associated with the sample at a concentration above the practical quantitation limit (PQL) and the results are considered acceptable.

D. Field Blanks:

 ${\tt D.1}$ There were no field blanks analyses associated with the project sample.

E. <u>Laboratory Replicate Analyses:</u>

E.1 Laboratory replicate analyses submitted with project data met all applicable QC criteria for precision as measured by Relative Percent Difference (RPD) and the results are considered acceptable.

F. Field Duplicate Analyses:

F.1 There were no field duplicate analyses associated with the project sample.

G. Quantitation:

G.1 The TSS result in sample number LAY-AOC5-SW01 was reported to be 2.4~mg/L on the associated sample data sheet. The true value should be 23.5~mg/L according to the raw data submitted by the laboratory. This transcription error should be noted (see modified sample data sheet).

G.2 No other problems were encountered with sample quantitation.

H. <u>Conclusion</u>:

H.1 All data are considered valid and usable for all purposes.

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DATA VALIDATION REPORT

PROGRAM: Elmendorf AFB/Point Lay RI/FS (ICF Project No. 41096-412-02)

LABORATORY: Commercial Testing & Engineering Co. (Anchorage, AK)

REVIEWER: Sh

Sharon Lin, ICF Kaiser Engineers, Inc.

ANALYSIS:

Total Suspended Solids by USEPA Method 160.2

MATRIX:

Water

DATE:

February 3, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (CT&E) (Anchorage, AK) received one (1) water sample for Total Suspended Solids (TSS) analysis by USEPA Method 160.2 on August 24, 1993. The sample was analyzed for TSS on August 31, 1993.

The ICF site identification number and corresponding CT&E laboratory sample identification number are listed below.

ICF Site No.

Lab Sample No.

LAY-LF01-SW08

4358-4

The analytical result is presented on the sample data sheet submitted by the laboratory (definitions of data qualifiers are listed in Table 1B). This report was prepared in accordance with the USEPA draft document "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analysis," October 1989, USEPA Method 160.2 and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. <u>Technical Holding Times:</u>

A.1 All technical holding time QC criteria were met for project sample analyses.

B. Calibration:

B.1 Method calibration is not a requirement for USEPA Method 160.2.

- C. <u>Laboratory Blanks</u>:
 - C.1 TSS was not detected in the method blank associated with the sample at a concentration above the practical quantitation limit (PQL) and the results are considered acceptable.
- D. <u>Field Blanks</u>:
 - D.1 There were no field blank analyses associated with the project sample.
- E. <u>Laboratory Replicate Analyses:</u>
 - E.1 Laboratory replicate analyses submitted with project data met all applicable QC criteria for precision as measured by Relative Percent Difference (RPD) and the results are considered acceptable.
- F. Field Duplicate Analyses:
 - F.1 There were no field duplicate analyses associated with the project sample.
- G. Quantitation:
 - G.1 No problems were encountered with sample quantitation.
- H. Conclusion:
 - H.1 All data are considered valid and usable for all purposes.

TABLE 1B DATA QUALIFIERS

NO QUALIFIERS indicates that the data are acceptable both qualitatively and quantitatively.

- U Indicates that the compound is not present above the concentration listed.
- L Indicates results which fall between the Instrument Detection Limit for waters or the Method Detection Limit for soils and the Practical Quantitation Limit. Results are considered estimates and are usable for limited purposes.
- J Results are considered estimates and are usable for <u>limited</u> purposes.
- R Results are rejected and data are unusable for any purpose.

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DATA VALIDATION REPORT

PROGRAM: LABORATORY: Dewline/Point Lay RI/FS (ICF Project No. 41096-412-02) Commercial Testing & Engineering Co. (Anchorage, AK)

REVIEWER:

Sharon Lin, ICF Kaiser Engineers, Inc.

ANALYSIS:

Total and Dissolved Metals by USEPA Method 6010

Total and Dissoved Thallium by USEPA Method 7841

MATRIX:

Water

DATE:

April 15, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (CT&E) (Anchorage, AK) received two (2) water samples for total and dissolved metals and thallium analyses by USEPA Methods 6010 and 7841 on August 26, 1993. The samples were digested on September 2 and 15, 1993 and were analyzed for total and dissolved metals by inductively coupled plasma atomic emission spectroscopy (ICP) and for total and dissolved thallium by atomic absorption furnace technique (GFAA) on September 6 through 17, 1993.

The ICF site identification numbers and corresponding CT&E laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	
LAY-LF01-SW08	93.4358-04	
LAY-SS06-SW02	93.4358-05	
LAY-LF01-SW08 (F)	93.4358-04	
LAY-SS06-SW02 (F)	93.4358-05	

Sample numbers LAY-LF01-SW08 (F) and LAY-SS06-SW02 (F) were designated as field filtered samples and analyzed for dissolved metals and thallium.

The analytical results with qualifications are presented on modified sample data sheets included in the report appendix. Definitions of data qualifiers are provided in Table 1B. This report was prepared according to the USEPA draft document *Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analysis,* October 1989, USEPA Method 6010, USEPA Method 7841, and the Project Sampling and Analysis Plan.

II. VALIDITY and COMMENTS:

- A. <u>Technical Holding Times</u>:
 - A.1 Technical holding time QC criteria were met for all project sample analyses.
- B. <u>Initial Calibration</u>:
 - B.1 All initial calibration QC criteria were met for project sample analyses and the results are considered acceptable.
- C. Continuing Calibrations:
 - C.1 All continuing calibration QC criteria were met for project sample analyses and the results are considered acceptable.
- D. Laboratory Blank Analyses:
 - D.1 No target analytes were detected in the laboratory and calibration blanks (initial and continuing calibration blanks) above the Practical Quantitation Limit (PQL) and the results are considered acceptable.
- E. Field Blanks:
 - E.1 No field blank analyses were included with the project documentation.
- F. Field Duplicate Analysis:
 - F.1 No field duplicate analyses were included with the project documentation.
- G. Laboratory Replicate Analysis:
 - G.1 No laboratory replicate analysis was included with the project documentation.
- H. ICP Interference Check Sample (ICS) Analyses:
 - H.1 All QC criteria were met for the ICS analyses and the results are considered acceptable.
- I. Laboratory Control Sample (LCS) Analyses:
 - I.1 All QC criteria were met for the LCS analyses and the results are considered acceptable.
- J. Matrix Spike (MS) Analysis:
 - J.1 Sample number LAY-LF01-SW04 was utilized for the MS analysis. The MS recovery for total and dissolved silver in the above MS sample were 44% and 43%, respectively, below the QC limits of 75-125%. Therefore, all nondetected results for silver in all project samples are considered as estimates (J) and usable for limited purposes only (see modified sample data sheets). The above noted nondetected results may be false negatives.
 - J.2 The MS recoveries for total and dissolved iron were outside the advisory QC limits. However, the sample concentration exceeded the spike concentration by a factor of four or more for the above noted target analyte. Therefore, data are not qualified on the basis of the deviations in MS recoveries.
 - J.3 Due to above noted deviations in MS recoveries, post-digestion spike recovery analyses were performed on September 6, 1993. The recovery results for all post-digestion spike analyses met applicable QC criteria.

J.4 All other applicable QC criteria were met for the MS analyses and the results are considered acceptable.

K. Quantitation:

K.1 No problems were observed with analyte quantitation in project sample analyses.

L. <u>Conclusion</u>:

- L.1 Due to above noted deficiencies in matrix spike analyses, select data are considered estimated and usable for limited purposes only.
- L.2 All other data are considered valid and usable for all purposes.

ICF KAISER ENGINEERS, INC. 1800 HARRISON STREET P.O. BOX 23210 OAKLAND, CALIFORNIA 94612-3430 510/419-6000 FAX 510/419-5355

DATA VALIDATION REPORT

PROGRAM: LABORATORY: Dewline/Point Lay RI/FS (ICF Project No. 41096-412-02) Commercial Testing & Engineering Co. (Anchorage, AK)

REVIEWER:

Sharon Lin, ICF Kaiser Engineers, Inc.

ANALYSIS:

Total and Dissolved Metals by USEPA Method 6010

Total and Dissoved Thallium by USEPA Method 7841

MATRIX:

Water

DATE:

April 15, 1994

I. INTRODUCTION:

Commercial Testing & Engineering Co. (CT&E) (Anchorage, AK) received two (2) water samples for total and dissolved metals and thallium analyses by USEPA Methods 6010 and 7841 on August 25, 1993. The samples were digested on September 2 and 15, 1993 and were analyzed for total and dissolved metals by inductively coupled plasma atomic emission spectroscopy (ICP) and for total and dissolved thallium by atomic absorption furnace technique (GFAA) on September 3 through 17, 1993.

The ICF site identification numbers and corresponding CT&E laboratory sample identification numbers are listed below.

ICF Site No.	<u>Lab Sample No</u>	
LAY-EB01	93.4328-02	
LAY-BKGD-SW01	93.4328-05	
LAY-BKGD-SW01 (F)	93.4328-05	

Sample number LAY-EB01 was designated as an "equipment blank."

Sample numbers LAY-BKGD-SW01 (F) was designated as a field filtered sample and analyzed for dissolved metals and thallium.

The analytical results with qualifications are presented on modified sample data sheets included in the report appendix. Definitions of data qualifiers are provided in Table 1B. This report was prepared according to the USEPA draft document "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analysis," October 1989, USEPA Method 6010, USEPA Method 7841, and the Project Sampling and Analysis Plan.

II. VALIDITY and COMMENTS:

A. <u>Technical Holding Times:</u>

A.1 Technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:

B.1 All initial calibration QC criteria were met for project sample analyses and the results are considered acceptable.

C. Continuing Calibrations:

C.1 All continuing calibration QC criteria were met for project sample analyses and the results are considered acceptable.

D. <u>Laboratory Blank Analyses:</u>

D.1 No target analytes were detected in the laboratory and calibration blanks (initial and continuing calibration blanks) above the Practical Quantitation Limit (PQL) and the results are considered acceptable.

E. Field Blanks:

E.1 No target analytes were detected at concentrations above the PQL in the field blank analyses and the results are considered acceptable.

F. Field Duplicate Analysis:

F.1 No field duplicate analyses were included with the project documentation.

G. <u>Laboratory Replicate Analysis:</u>

G.1 No laboratory replicate analysis was included with the project documentation.

H. ICP Interference Check Sample (ICS) Analyses:

H.1 All QC criteria were met for the ICS analyses and the results are considered acceptable.

I. <u>Laboratory Control Sample (LCS) Analyses:</u>

I.1 All QC criteria were met for the LCS analyses and the results are considered acceptable.

J. Matrix Spike (MS) Analysis:

- J.1 Sample number LAY-BKGD-SW01 was utilized for the MS analysis. The MS recovery for total and dissolved silver in the above MS sample were 66% and 67%, respectively, below the QC limits of 75-125%. Therefore, all nondetected results for silver in all project samples are considered as estimates (J) and usable for limited purposes only (see modified sample data sheets). The above noted nondetected results may be false negatives.
- J.2 Due to above noted deviations in MS recoveries, post-digestion spike recovery analyses were performed on September 6, 1993. The recovery results for all post-digestion spike analyses met applicable QC criteria.
- J.3 All other applicable QC criteria were met for the MS analyses and the results are considered acceptable.

K. Quantitation:

- K.1 No problems were observed with analyte quantitation in project sample analyses.
- K.2 The sample result for the target analyte magnesium in sample number LAY-BKGD-SW01 was reported incorrectly, as nondetected (U) on the sample data sheet submitted by the laboratory. This transcription error has been corrected and this should be noted (see modified sample data sheet).

L. <u>Conclusion</u>:

- L.1 Due to above noted deficiencies in matrix spike analyses, select data are considered estimated and usable for limited purposes only.
- L.2 All other data are considered valid and usable for all purposes.

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DATA VALIDATION REPORT

PROGRAM: Elmendorf AFB/Point Lay RI/FS (ICF Project No. 41096-412-02)

LABORATORY: Commercial Testing & Engineering Co. (Anchorage, AK)

REVIEWER: Sharon Lin, ICF Kaiser Engineers, Inc.

ANALYSIS: Total & Dissolved Metals by USEPA Method 6010 &

Total & Dissolved Thallium by USEPA Method 7841

MATRIX: Soil & Water
DATE: February 3, 1994

I. <u>INTRODUCTION</u>:

Commercial Testing & Engineering Co. (CT&E) (Anchorage, AK) received two (2) soil samples for total metals analyses and one (1) water sample for total and dissolved metals analyses by USEPA Methods 6010 and 7841 on August 26, 1993. The samples were digested on August 30 through September 15, 1993 and analyzed for total and dissolved metals by inductively coupled plasma atomic emission spectroscopy (ICP) and for total and dissolved thallium by atomic absorption furnace technique (GFAA) on August 30 through September 17, 1993.

The ICF site identification numbers and corresponding CT&E laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	<u>Matrix</u>
LAY-AOC5-SW01	4354-1	Water
LAY-AOC5-SW01 (F)	4354-1	Water
LAY-SS06-S03	4354-4	Soil
LAY-LF01-SD04	4354-6	Soil

Sample number LAY-AOC5-SW01 (F) was designated as a field-filtered sample and analyzed for dissolved metals and thallium.

The analytical results with qualifications are presented on modified sample data sheets included in the report appendix. Definitions of data qualifiers are provided in Table 1B. This report was prepared according to the USEPA draft document "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analysis," October 1989, USEPA Method 6010, USEPA Method 7841, and the Project Sampling and Analysis Plan.

II. VALIDITY and COMMENTS:

- A. <u>Technical Holding Times</u>:
 - A.1 Technical holding time QC criteria were met for all project sample analyses.
- B. Initial Calibration:
 - B.1 Initial calibration QC criteria were met for project sample analyses and the results are considered acceptable.
- C. Continuing Calibrations:
 - C.1 Continuing calibration QC criteria were met for project sample analyses and the results are considered acceptable.
- D. <u>Laboratory Blank Analyses:</u>
 - D.1 No target analytes were detected in the method and calibration blanks (initial and continuing calibration blanks) above the Practical Quantitation Limit (PQL) and the results are considered acceptable.
- E. Field Blanks:
 - E.1 There were no field blanks analyses included in the project documentation.
- F. Field Duplicate Analysis:
 - F.1 There were no field duplicate analyses included in the project documentation.
- G. Laboratory Replicate Analysis:
 - G.1 There were no laboratory replicate analyses included in the project documentation.
- H. ICP Interference Check Sample (ICS) Analyses:
 - H.1 All applicable QC criteria were met for the ICS analyses and the results are considered acceptable.
- I. Laboratory Control Sample (LCS) Analyses:
 - I.1 All LCS analyses associated with project samples met applicable QC criteria and the results are considered acceptable.
- J. <u>Matrix Spike (MS) Analysis</u>:
 - J.1 Sample number LAY-LF01-SD04 was utilized for MS analyses. The MS recovery for silver in sample number LAY-LF01-SD04-MS was 0%, falling outside the established QC limits of 75-125%. Therefore, all non-detected results for silver in sample numbers LAY-SS06-S03 and LAY-LF01-SD04 are considered rejected (R) and unusable for any purpose (see modified sample data sheets).
 - J.2 Sample number LAY-AOC5-SW01 (F) was utilized for MS analyses. The MS recovery for silver in sample number LAY-AOC5-SW01(F)-MS was 45%, falling outside the established QC limits of 75-125%. Therefore, the sample result for silver in

sample number LAY-AOC5-SW01 (F) is considered as an estimate (J) and usable for limited purposes only (see modified sample data sheet).

J.3 The recoveries for the following analytes in the MS analyses associated with sample numbers LAY-SS06-S03 and LAY-LF01-SD04 fell outside the advisory QC limits of 75-125%:

Sample number	<u>Analyte</u>	<pre>%Recovery</pre>	<u>Bias</u>
LAY-LF01-SD04-MS	Antimony	66	Low
LAY-LF01-SD04-MS	Manganese	192	High

Due to above noted deviations in MS recoveries, the above noted sample results are considered as estimates (J) and usable for limited purposes only (see modified sample data sheets).

The non-detected results for antimony in the associated samples may be false-negatives.

The detected results for manganese in the associated samples may be biased high.

- J.4 The MS recoveries for aluminum and iron were outside the advisory QC limits. However, the sample concentration exceeded the spike concentration by a factor of four or more for the above noted target analytes. Therefore, data are not qualified on the basis of the deviations in MS recoveries.
- J.5 Due to above noted deviations in matrix spike recoveries (see J.1-J.4), post-digestion spike recovery analyses were performed on September 2 and 6, 1993. The recovery results for all post-digestion spike analyses met applicable QC criteria.
- J.6 All other applicable QC criteria were met for the matrix spike analyses and the results are considered acceptable.

K. Quantitation:

 ${\rm K.1}$ No problems were observed with analyte quantitation in project sample analyses.

L. <u>Conclusion</u>:

- L.1 Due to above noted deficiencies in matrix spike analyses, select data are considered rejected and unusable for any purpose.
- L.2 Due to above noted deficiencies in matrix spike analyses, select data are considered estimates and usable for limited purposes.
- L.3 All other data are considered valid and usable for all purposes.

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DATA VALIDATION REPORT

PROGRAM:

Dewline/Point Lay RI/FS (ICF Project No. 41096-412-02)

LABORATORY: **REVIEWER:**

Commercial Testing & Engineering Co. (Anchorage, AK)

ANALYSIS:

Sharon Lin, ICF Kaiser Engineers, Inc. Total Metals by USEPA Method 6010

Total Thallium by USEPA Method 7841 Water

MATRIX: DATE:

April 15, 1994

١. INTRODUCTION:

Commercial Testing & Engineering Co. (CT&E) (Anchorage, AK) received four (4) soil samples for total and dissolved metals and thallium analyses by USEPA Methods 6010 and 7841 on August 25, 1993. The samples were digested on August 30, 1993 and were analyzed for total metals by inductively coupled plasma atomic emission spectroscopy (ICP) and for total thallium by atomic absorption furnace technique (GFAA) on September 1 through 6, 1993.

The ICF site identification numbers and corresponding CT&E laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.
LAY-AOC5-SD01	93.4327-01
LAY-AOC5-S06	93.4327-02
LAY-BKGD-SD01	93.4327-05
LAY-BKGD-S01	93.4327-06

The analytical results with qualifications are presented on modified sample data sheets included in the report appendix. Definitions of data qualifiers are provided in Table 1B. This report was prepared according to the USEPA draft document "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analysis," October 1989, USEPA Method 6010, USEPA Method 7841, and the Project Sampling and Analysis Plan.

II. VALIDITY and COMMENTS:

A. <u>Technical Holding Times</u>:

A.1 Technical holding time QC criteria were met for all project sample analyses.

B. <u>Initial Calibration</u>:

B.1 All initial calibration QC criteria were met for project sample analyses and the results are considered acceptable.

C. Continuing Calibrations:

C.1 All continuing calibration QC criteria were met for project sample analyses and the results are considered acceptable.

D. <u>Laboratory Blank Analyses:</u>

D.1 No target analytes were detected in the laboratory and calibration blanks (initial and continuing calibration blanks) above the Practical Quantitation Limit (PQL) and the results are considered acceptable.

E. Field Blanks:

E.1 No field blank analyses were included with the project documentation.

F. Field Duplicate Analysis:

F.1 No field duplicate analyses were included with the project documentation.

G. <u>Laboratory Replicate Analysis:</u>

G.1 No laboratory replicate analysis was included with the project documentation.

H. ICP Interference Check Sample (ICS) Analyses:

H.1 All QC criteria were met for the ICS analyses and the results are considered acceptable.

I. Laboratory Control Sample (LCS) Analyses:

I.1 All QC criteria were met for the LCS analyses and the results are considered acceptable.

J. Matrix Spike (MS) Analysis:

J.1 Sample number LAY-AOC5-S06 was utilized for the MS analysis. The MS recovery silver was 0%, below the QC limits of 75-125%. Therefore, all nondetected results for silver in all project samples are considered as rejected (R) and unusable for all purposes (see modified sample data sheets).

J.2 MS recoveries for the following analytes were outside the advisory QC limits of 75-125%:

Sample No.	<u>Analyte</u>	%Recovery	<u>Bias</u>
LAY-AOC5-S06 MS	Antimony	66	Low
LAY-AOC5-S06 MS	Manganese	192	High
LAY-AOC5-S06 MS	Selenium	129	High

Due to above deviations in MS recoveries, all nondetected results for antimony, all detected results for manganese and selenium are considered as estimated (J) and usable for limited purposes only (see modified sample data sheets). The nondetected results for antimony in the associated samples may be false negatives and the detected results for manganese and selenium in the associated samples may be biased high.

- J.3 The MS recoveries for aluminum and iron were outside the advisory QC limits. However, the sample concentration exceeded the spike concentration by a factor of four or more for the above noted target analytes. Therefore, data are not qualified on the basis of the deviations in MS recoveries.
- J.4 Due to above noted deviations in MS recoveries, post-digestion spike recovery analyses were performed on September 2, 1993. The recovery results for all post-digestion spike analyses met applicable QC criteria.
- J.5 All other applicable QC criteria were met for the MS analyses and the results are considered acceptable.

K. Quantitation:

K.1 No problems were observed with analyte quantitation in project sample analyses.

L. Conclusion:

- L.1 Due to above noted deficiencies in matrix spike analyses, select data are considered rejected and unusable for any purpose.
- L.2 Due to above noted deficiencies in matrix spike analyses, select data are considered estimated and usable for limited purposes only.
- L.3 All other data are considered valid and usable for all purposes.

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DATA VALIDATION REPORT

PROGRAM:

POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)

LABORATORY:

Friedman & Bruya, Inc. (Seattle, WA)

REVIEWER:

Clyde Hedin

ANALYSIS:

Diesel by EPA Method 8015M

MATRIX:

Water

DATE:

June 16, 1994

I. <u>INTRODUCTION:</u>

Friedman & Bruya, Inc. (Seattle, WA) received 11 water samples from the Point Lay site on August 24, 1993 (referenced chain of custody record No. 545) for diesel analysis by the semivolatile organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for diesel by USEPA Method 8015M (modified) (GC/FID) on August 27, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	<u>Lab Sample No.</u>	<u>Matrix</u>
LAY-EB02	557	Water
LAY-LF01-SW01	559	Water
LAY-LF01-SW02	560	Water
LAY-LF01-SW03	561	Water
LAY-LF01-SW04	562	Water
LAY-LF01-SW05	563	Water
LAY-LF01-SW06	564	Water
LAY-LF01-SW07	565	Water
LAY-LF01-SW08	566	Water
LAY-SS06-SW02	567	Water

The quantitation limits reported by the laboratory for the water samples (1000 ppb) were higher than those specified in the Project Sampling and Analysis Plan (500 ppb). It is the opinion of the reviewer that the quality of the data is not affected.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document "National Functional Guidelines for Organic Data Review", December 1990, and the analytical guidelines in USEPA Method 8015M, and the Project Sampling and Analysis Plan.

The following QC sample designations were included in project documentation: sample numbers LAY-LF01-SW04 and LAY-LF01-SW08 were designated as field duplicates.

II. VALIDITY & COMMENTS:

A. <u>Technical Holding Times:</u>

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. <u>Initial Calibration:</u>

B.1 The laboratory analyzed a 5 point initial calibration on GC instrument ICF5 on 8/25/93. The attempted range of the initial calibration was from 10 ppm to 10,000 ppm. Due to low sensitivity and interference, the 10 ppm calibration standard was deleted from the calibration. All samples were quantitated using a linear regression curve calculated from the initial calibration. A percent relative standard deviation (%RSD) of 31.2% was calculated using calibration factors determined from the initial 6 point calibration. The RSD of 31.2% exceeds the recommended QC criteria of 20.0%, possibly due to inconsistent integration techniques employed by the laboratory. Reintegration of the initial calibration standards may reduce the calibration factor %RSD to a value less than what was reported. Since the initial calibration exceeds the recommended QC criteria of 20.0%, the detected results for diesel in the project samples are qualified "J" as estimated and usable for limited purposes.

C. Continuing Calibration:

C.1 The continuing calibration 098F0601 exceeded the acceptable QC criteria due to poor integration techniques. All detected sample results and PQLs associated with this calibration are qualified "J" as estimated and useable for limited purposes.

D. <u>Laboratory Blanks:</u>

D.1 Diesel was not detected in the method blanks at concentrations above the PQL and the results are considered acceptable.

E. Instrument Blanks:

E.1 Diesel was not detected in the instrument blanks at concentrations above the PQL and the results are considered acceptable.

F. Field Blanks:

There were no field blanks submitted for analysis with this project sample set.

G. Field Replicate Analyses:

- G.1 A QC limit for precision of \leq 20%, as measured by Relative Percent Difference (RPD) between water sample values, was specified for field replicate comparability.
- G.2 Samples LAY-LF01-SW04 and LAY-LF01-SW08 were utilized for field duplicate analysis. The results of the field duplicate analyses met all applicable QC criteria and the results are considered acceptable.

H. <u>Surrogate Recoveries:</u>

H.1 All project sample surrogate recoveries met applicable QC criteria and the results are considered acceptable.

I. <u>Matrix Spike/Matrix Spike Duplicate:</u>

- 1.1 Distilled water was spiked, analyzed, and reported by the laboratory for the water matrix spike/matrix spike duplicate analyses for chain of custody 545.
- 1.2 The matrix spike duplicate recovery and Relative Percent Deviation (RPD) exceeded QC criteria due to poor integration techniques used by the laboratory.

J. <u>System Performance</u>:

J.1 No problems with system performance were observed for all project samples.

K. Quantitation and Identification:

- K.1 Surrogate recoveries for the TW matrix spike duplicate exceeded the QC criteria.
- K.5 No other problems were observed with compound quantitation and identification.

L. Conclusion:

- L.1 Diesel was not detected at concentrations above the PQL in any of the project samples.
- L.2 Due to problems with the initial calibration, the detected results for the project samples are qualified "J" as estimated and usable for limited purposes.
- L.3 Due to problems with the continuing calibration, the detected results and PQLs for the project samples LAY-LF01-SW07, LAY-LF01-SW08, and LAY-SS06-SW02 are qualified "J" as estimated and usable for limited purposes.
- L.4 All other data are considered valid and usable for all purposes.

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DATA VALIDATION REPORT

PROGRAM:

POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)

LABORATORY:

Friedman & Bruya, Inc. (Seattle, WA)

REVIEWER:

Timothy Vonnahme

ANALYSIS:

Diesel by EPA Method 8015M

MATRIX:

Soil

DATE:

June 1, 1994

I. <u>INTRODUCTION:</u>

Friedman & Bruya, Inc. (Seattle, WA) received 12 soil samples from the Point Lay site on August 23, 1993 (referenced chain of custody record No. 538) for diesel analysis by the semivolatile organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for diesel by USEPA Method 8015M (modified) (GC/FID) on August 24, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	<u>Lab Sample No.</u>	<u>Matrix</u>
LAY-AOC5-S01	417	Soil
LAY-AOC5-S02	419	Soil
LAY-AOC5-S03	421	Soil
LAY-AOC5-S04	423	Soil
LAY-AOC5-S05	425	Soil
LAY-AOC5-S06	427	Soil
LAY-AOC5-S07	429	Soil
LAY-BKGD-SD01	431	Soil
LAY-BKGD-S01	433	Soil
LAY-BKGD-S02	435	Soil
LAY-BKGD-S03	437	Soil
LAY-BKGD-S04	439	Soil

The quantitation limits reported by the laboratory for the soil samples (50 ppm) were higher than those specified in the Project Sampling and Analysis Plan (10 ppm). It is the opinion of the reviewer that the quality of the data was not affected.

The following QC sample designations were included in project documentation: sample numbers LAY-AOC5-S01 and LAY-AOC5-S07 were designated as field replicates.

The analytical results for the soil samples were reported with an adjustment for moisture content.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document "National Functional Guidelines for Organic Data Review", December 1990, and the analytical guidelines in USEPA Method 8015M, and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. <u>Technical Holding Times:</u>

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. <u>Initial Calibration</u>:

B.1 The laboratory analyzed a 7 point initial calibration on GC instrument ICF5 on August 21, 1993. The attempted range of the initial calibration was from 10 ppm to 10,000 ppm. Due to low sensitivity and interference, the 10 ppm calibration standard was deleted from the calibration. All samples were quantitated using a linear regression curve calculated from the initial calibration. A percent relative standard deviation (%RSD) of 12.0% was calculated using calibration factors determined from the initial 6 point calibration. The RSD of 12.0% is within the recommended QC criteria of 20.0%.

C. <u>Continuing Calibration:</u>

C.1 All QC criteria for the continuing calibrations were met and the results are considered acceptable.

D. Laboratory Blanks:

D.1 Diesel was not detected in the method blank at a concentration above the PQL and the results are considered acceptable.

E. <u>Instrument Blanks:</u>

E.1 Diesel was not detected in the instrument blanks at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 There were no field blank analyses associated with this project sample set.

G. Field Replicate Analyses:

G.1 A QC limit for precision of ≤ 50%, as measured by Relative Percent Difference (RPD) between soil sample values, was specified for field replicate comparability.

G.2 Samples LAY-AOC5-S01 and LAY-AOC5-S07 were utilized for field replicate analysis. The results of the field replicate analyses, as reported by the laboratory, met all applicable QC criteria and the results are considered acceptable.

H. <u>Surrogate Recoveries:</u>

H.1 The surrogate recoveries for the following samples, LAY-AOC5-S01, LAY-AOC5-S02, LAY-AOC5-S03, LAY-AOC5-S04, and the QC samples were calculatedd by the reviewer using peak height instead of area due to incorrect peak integrations submitted by the laboratory. The surrogate recoveries using area counts reported by the laboratory for these samples could not be verified by the reviewer. Since both sets of surrogate recoveries met the QC criteria, no action was taken.

H.2 All other surrogate recoveries met applicable QC criteria and the results are considered acceptable.

I. <u>Matrix Spike/Matrix Spike Duplicate:</u>

- I.1 Sample number LAY-AOC5-S06 was used as the matrix spike/matrix spike duplicate sample.
- 1.2 The reviewer could not verify the MS/MSD percent recoveries because the laboratory failed to submit the reintegrated areas. It is not known what affect this will have on the data.

J. System Performance:

- J.1 Four of the samples contained biological material reported by the laboratory at concentrations ranging between 40-270 ppm. Carryover did not appear to present a problem between these samples.
- J.2 No other problems with system performance were observed for all project samples.

K. Quantitation and Identification:

K.1 Discrepancies exist between the detected amount of diesel reported by the laboratory and the amount of diesel calculated by the reviewer in some of the project samples. Listed below are the results reported by the laboratory and the results regenerated by the reviewer. The results are listed in parts per million (ppm).

ICF Site No.	Laboratory Results	Validation Results
LAY-AOC5-S01	5400	7200
LAY-AOC5-S06	2200	2900
LAY-AOC5-S06 dup	1700	2300
LAY-AOC5-S07	5400	7200

It appears that the laboratory used an incorrect linear regression equation to quantitate the amount of diesel in the samples. The detected results for these samples have been changed on the data summary forms by the reviewer.

K.2 The laboratory reported an incorrect PQL for sample LAY-BKGD-S04. The

PQL has been corrected on the data summary form by the reviewer.

K.3 No other problems were observed with compound quantitation and identification.

L. <u>Conclusion:</u>

- L.1 Diesel was detected in samples LAY-AOC5-S01, LAY-AOC5-S06, and LAY-AOC5-S07 at concentrations ranging between 2900 and 7200 ppm, as calculated by the reviewer.
- L.2 The laboratory reported an incorrect PQL for sample LAY-BKGD-S04. The PQL has been corrected on the data summary form by the reviewer.
- L.3 Surrogate recoveries for samples LAY-AOC5-S01, LAY-AOC5-S02, LAY-AOC5-S03, LAY-AOC5-S04, and the QC samples were calculated by the reviewer using peak height instead of area due to incorrect peak integrations submitted by the laboratory.
- L.4 The reviewer could not verify the MS/MSD percent recoveries because the laboratory failed to submit the reintegrated areas. It is not known what affect this will have on the data.
- L.5 All other data are considered valid and usable for all purposes.

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DATA VALIDATION REPORT

PROGRAM:

POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)

LABORATORY:

Friedman & Bruya, Inc. (Seattle, WA)

REVIEWER:

Timothy Vonnahme

ANALYSIS:

Diesel by EPA Method 8015M

MATRIX:

Water and Soil

DATE:

May 25, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (Seattle, WA) received 3 soil and 4 water samples from the Point Lay site on August 23, 1993 (referenced chain of custody record No. 537). Six of the samples were requested for diesel analysis by the semivolatile organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for diesel by USEPA Method 8015M (modified) (GC/FID) on August 24 and August 25, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	<u>Lab Sample No.</u>	<u>Matrix</u>
LAY-EB-01	446	Water
LAY-BKGD-SW01	457	Water
LAY-BKGD-SW02	462	Water
LAY-AOC5-SD01	463	Soil
LAY-AOC5-SD02	465	Soil
LAY-AOC5-SD03	467	Soil

The following QC sample designations were included in project documentation: sample number LAY-EB-01 was designated as an equipment blank.

The analytical results for the soil samples were reported with an adjustment for moisture content.

The instrument Number-Sequence Date on the data summary form for water samples LAY-EB-01, LAY-BKGD-SW01, and LAY-BKGD-SW02 were inadvertently recorded by the laboratory as ICF5 08-25-93 instead of ICF6 08-23-93.

The quantitation limits reported by the laboratory for the water samples (200 ppb) were lower than those specified in the Project Sampling and Analysis Plan (500 ppb). However, since the low point of the initial calibration is 50 ppm, the PQL should be 1000 ppb. The PQL has been adjusted on the data summary form by the reviewer.

The quantitation limits reported by the laboratory for the soil samples (50 ppm) were higher than those specified in the Project Sampling and Analysis Plan (10 ppm). Since the low point of the initial calibration is 50 ppm, the practical quantitation limit (PQL) should be 50 ppm. It is the opinion of the reviewer that the quality of the data was not affected.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document "National Functional Guidelines for Organic Data Review", December 1990, and the analytical guidelines in USEPA Method 8015M, and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. <u>Technical Holding Times:</u>

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. <u>Initial Calibration:</u>

- B.1 The laboratory analyzed a 7 point initial calibration on GC instrument ICF5 on August 21, 1993. The attempted range of the initial calibration was from 10 ppm to 10,000 ppm. Due to low sensitivity and interference, the 10 ppm calibration standard was deleted from the calibration. All samples were quantitated using a linear regression curve calculated from the initial calibration. A percent relative standard deviation (%RSD) of 19.1% was calculated using calibration factors determined from the initial 6 point calibration. The RSD of 19.1% is within the recommended QC criteria of 20.0%.
- B.2 The laboratory attempted to perform a 6 point initial calibration on GC instrument ICF6 on August 21, 1993. The range of the initial calibration was from 50 ppm to 10,000 ppm. The 500 ppm and the 200 ppm standards were not used due to autosampler injection errors. A percent relative standard deviation (%RSD) of 48.3 was calculated using calibration factors determined from the initial calibration. The %RSD of 48.3% exceeds the recommended QC criteria of 20.0%.

Since the initial calibration was only a 4 point calibration curve, and the %RSD exceeds the recommended criteria, the detected results for diesel in all the water samples are qualified "J" as estimated and usable for limited purposes.

B.3 Due to an increase in sensitivity, a second 3 point initial calibration on GC instrument ICF6 was performed on August 28, 1993. The range of this initial calibration was from 100 ppm to 10,000 ppm. A percent relative standard deviation (%RSD) of 9.07 was calculated using calibration factors determined from the initial

calibration. Since this initial calibration was performed after the samples were analyzed, it can not be used for quantitation of this sample set, but can be used as a reference to explain the increased sensitivity in this sample set.

C. <u>Continuing Calibration:</u>

C.1 All QC criteria for the continuing calibrations were met on both instruments and the results are considered acceptable.

D. Laboratory Blanks:

D.1 Diesel was not detected in the method blanks at a concentration above the PQL and the results are considered acceptable.

E. <u>Instrument Blanks:</u>

E.1 Diesel was not detected in the instrument blanks at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

- F.1 Sample number LAY-EB-01 was designated as an equipment blank.
- F.2 Diesel was not detected in the equipment blank at a concentration above the PQL and the results are considered acceptable.

G. Field Replicate Analyses:

G.1 There were no field replicate samples associated with this project sample set.

H. Surrogate Recoveries:

- H.1 The laboratory reported incorrect surrogate areas on the quantitation reports for the three soil samples and associated QC sample, resulting in recoveries outside the QC criteria. Since no reintegration of the peak areas were submitted, the reviewer calculated the surrogate recoveries using peak height. All three surrogate recoveries were within the QC criteria. It is the opinion of the reviewer that the quality of the data was not affected.
- H.2 All other surrogate recoveries met applicable QC criteria and the results are considered acceptable.

I. <u>Matrix Spike/Matrix Spike Duplicate:</u>

I.1 Sample number LAY-AOC5-S06 was used for the soil matrix spike/matrix spike duplicate analyses. The sample was not included on chain-of-custody 537. The laboratory results for the matrix spike sample and matrix spike duplicate sample could not be verified by the reviewer because the reintregated areas were not submitted by the laboratory. It is the opinion of the reviewer that the quality of the data was not affected.

J. System Performance:

J.1 The laboratory reported diesel in sample LAY-AOC5-SD01 at a concentration of 1500 ppm, and sample LAY-AOC5-SD02 at a concentration of 2800 ppm. It is the opinion of the reviewer that since no instrument blank was analyzed between

these two samples, the diesel detected in sample LAY-AOC5-SD02 is actually carryover from the previous sample. The reported result of 2800 ppm is primarily due to a percent solid of only 7%. Therefore, the PQL in sample number LAY-AOC5-SD02 has been adjusted to compensate for the carryover.

J.2 No other problems with system performance were observed for all project samples.

K. Quantitation and Identification:

- K.1 A discrepancy exists between the diesel result of 1500 ppm reported by the laboratory and the result of 1100 ppm regenerated by the reviewer for sample LAY-AOC5-SD01. The discrepancy is probably due to inconsistent quantitation procedures performed by the laboratory. The result has been adjusted on the data summary form by the reviewer.
- K.2 Since the low point of the initial calibration was 50 ppm, the PQL for the project water samples were adjusted to 1000 ppb on the data summary forms by the reviewer.
- K.3 The laboratory reported a detected result of 2800 ppm for diesel in sample LAY-AOC5-SD02. It is the opinion of the reviewer that since no instrument blank was analyzed between this sample and the previous high level sample, the diesel detected is actually carryover from the previous sample. The reported result of 2800 ppm is primarily due to a percent solid of only 7%. Therefore, the PQL in sample number LAY-AOC5-SD02 has been adjusted to compensate for the carryover.
- K.4 The surrogate recoveries for the soil samples and the associated QC sample were calculated by the reviewer using peak height instead of area because the laboratory did not submit the reintegrated surrogate areas. It is the opinion of the reviewer that the quality of the data was not affected.
- K.5 No other problems were observed with compound quantitation and identification.

L. Conclusion:

- L.1 Diesel was detected in sample LAY-AOC5-SD01 at a concentration of 1100 ppm.
- L.2 Diesel was detected by the laboratory in sample LAY-AOC5-SD02 at a concentration of 2800 ppm. It is the opinion of the reviewer that since no instrument blank was analyzed between this sample and the previous high level sample, the diesel detected is actually carryover from the previous sample. Therefore, the PQL in sample number LAY-AOC5-SD02 has been adjusted to compensate for the carryover.
- L.3 The PQL for the project water samples were adjusted to 1000 ppb on the data summary forms by the reviewer.

- L.4 The PQL for the project water samples were adjusted to 1000 ppb on the data summary forms by the reviewer.
- L.5 The results for the matrix spike and matrix spike duplicate samples could not be verified by the reviewer because the laboratory did not submit reintegrated diesel areas for the two QC samples.
- L.6 All other data are considered valid and usable for all purposes.

ICF KAISER ENGINEERS, INC. 2700 CHANDLER AVENUE, BUILDING C LAS VEGAS, NV 89120 702/795-0515

DATA VALIDATION REPORT

PROGRAM:

POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)

LABORATORY:

Friedman & Bruya, Inc. (Seattle, WA)

REVIEWER:

Timothy Vonnahme

ANALYSIS:

Diesel by EPA Method 8015M

MATRIX:

Soil

DATE:

June 14, 1994

I. <u>INTRODUCTION:</u>

Friedman & Bruya, Inc. (Seattle, WA) received 15 soil samples from the Point Lay site on August 24, 1993 (referenced chain of custody record No. 542) for diesel analysis by the semivolatile organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for diesel by USEPA Method 8015M (modified) (GC/FID) on August 26, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	Matrix
LAY-AOC4-SD01	628	Soil
LAY-AOC4-SD02	630	Soil
LAY-AOC4-SD03	632	Soil
LAY-AOC4-SD04	634	Soil
LAY-SS06-S01	636	Soil
LAY-SS06-S02	638	Soil
LAY-SS06-S03	640	Soil
LAY-SS06-S04	642	Soil
LAY-SS06-S05	644	Soil
LAY-SS06-S06	646	Soil
LAY-SS06-S07	648	Soil
LAY-SS06-S08	650	Soil
LAY-SS06-S09	652	Soil
LAY-SS06-S10	654	Soil
LAY-SS06-S11	656	Soil

The quantitation limits reported by the laboratory for the soil samples (50 ppm) were higher than those specified in the Project Sampling and Analysis Plan (10 ppm). It is the opinion of the reviewer that the quality of the data was not affected.

The following QC sample designation was included in project documentation: sample numbers LAY-SS06-S09 and LAY-SS06-S01 were designated as field replicates, and sample numbers LAY-SS06-S07 and LAY-SS06-S10 were also designated as field replicates.

The analytical results for the soil samples were reported with an adjustment for moisture content.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document "National Functional Guidelines for Organic Data Review", December 1990, and the analytical guidelines in USEPA Method 8015M, and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. <u>Technical Holding Times:</u>

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. <u>Initial Calibration:</u>

B.1 The laboratory analyzed a 7 point initial calibration on GC instrument ICF5 on August 25, 1993. The attempted range of the initial calibration was from 10 ppm to 10,000 ppm. Due to low sensitivity and interference, the 10 ppm calibration standard was deleted from the calibration. All samples were quantitated using a linear regression curve calculated from the initial calibration. A percent relative standard deviation (%RSD) of 31.2% was calculated using calibration factors determined from the initial 6 point calibration. The %RSD of 31.2% exceeds the recommended QC criteria of 20.0%. Therefore, the detected results for diesel in all project samples are qualified "J" as estimated and usable for limited purposes.

C. <u>Continuing Calibration:</u>

C.1 All QC criteria for the continuing calibrations were met and the results are considered acceptable.

D. <u>Laboratory Blanks:</u>

D.1 Diesel was not detected in the method blank at a concentration above the PQL and the results are considered acceptable.

E. Instrument Blanks:

E.1 Diesel was not detected in the instrument blanks at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 There were no field blank analyses associated with this project sample set.

G. Field Replicate Analyses:

- G.1 A QC limit for precision of \leq 50%, as measured by Relative Percent Difference (RPD) between soil sample values, was specified for field replicate comparability.
- G.2 Sample numbers LAY-SS06-S09 and LAY-SS06-S01 were utilized for field replicate analysis. The results of the field replicate analyses met all applicable QC criteria and the results are considered acceptable.
- G.3 Sample numbers LAY-SS06-S07 and LAY-SS06-S10 were also utilized for field replicate analysis. The results of the field replicate analyses met all applicable QC criteria and the results are considered acceptable.

H. <u>Surrogate Recoveries</u>:

- H.1 The surrogate recoveries for the following samples, LAY-SS06-S03, LAY-SS06-S04, LAY-SS06-S08, and LAY-SS06-S11 were calculated by the reviewer using peak height instead of area due to interference present in the sample. The above surrogate percent recoveries met all QC criteria.
- H.2 The laboratory did not report surrogate recoveries for samples LAY-SS06-S01, LAY-SS06-S02, and LAY-SS06-S09 due to high levels of interference making surrogate quantitation impossible. Since no surrogate recoveries were obtainable, all detected results or the PQLs for these three samples are qualified "J" as estimated and usable for limited purposes.
- H.3 All other surrogate recoveries met applicable QC criteria and the results are considered acceptable.

I. <u>Matrix Spike/Matrix Spike Duplicate</u>:

- 1.1 Sample number LAY-SS06-S07 was used as the matrix spike/matrix spike duplicate sample.
- 1.2 Discrepancies exist between the percent recoveries of diesel reported by the laboratory and the percent recovery of diesel as calculated by the reviewer for the following QC samples. Listed below are the results reported by the laboratory and the results regenerated by the reviewer.

ICF Site No.	Laboratory Results	Validation Results
MS	77%	48%
MSD	100%	53%

The validated results calculated by the reviewer were outside the QC criteria. It is not known what affect this will have on the quality of the data.

J. System Performance:

- J.1 Carryover did not appear to present a problem between the high level samples. Several instrument blanks were run between the high level samples, eliminating any possible carryover.
- J.2 No other problems with system performance were observed for all project samples.

K. Quantitation and Identification:

K.1 Discrepancies exist between the detected amount of diesel reported by the laboratory and the amount of diesel calculated by the reviewer in some of the project samples. Listed below are the results reported by the laboratory and the results regenerated by the reviewer. The results are listed in parts per million (ppm).

ICF Site No.	Laboratory Results	Validation Results
LAY-SS06-S01	25000	23000
LAY-SS06-S02	35000	33400
LAY-SS06-S04	20000	12800
LAY-SS06-S06	45000	62000
LAY-SS06-S08	2500	2600
LAY-SS06-S11	8300	7600

It appears that the laboratory used an incorrect linear regression equation to quantitate the amount of diesel in the samples and in some instances may not have allowed for the moisture content. The detected results for these samples have been adjusted on the data summary forms by the reviewer.

The laboratory reported 20000 ppm of diesel and motor oil for sample LAY-SS06-S04. The reviewer calculated 12800 ppm of diesel without including the motor oil.

- K.2 The laboratory did not dilute and reanalyze samples LAY-SS06-S01, LAY-SS06-S02, LAY-SS06-S04, and LAY-SS06-S06 which were outside the linear calibration curve. Therefore, the detected results for diesel in these samples are qualified "J" as estimated and usable for limited purposes.
- K.3 The laboratory reported incorrect PQLs for samples LAY-AOC4-SD01, LAY-AOC4-SD03, LAY-AOC4-SD04, LAY-SS06-S03, LAY-SS06-S07, and LAY-SS06-S10. The PQLs have been corrected on the data summary forms by the reviewer.
- K.4 The matrix spike and matrix spike duplicate recoveries as calculated by the reviewer were outside the QC criteria. It is not known what affect this will have on the data.
- K.5 No other problems were observed with compound quantitation and identification.

L. <u>Conclusion:</u>

L.1 Diesel was detected in select project soil samples. Several of the samples

were contaminated with lube oil, thus making exact quantitation difficult.

- L.2 The laboratory did not dilute and reanalyze samples LAY-SS06-S01, LAY-SS06-S02, LAY-SS06-S04, and LAY-SS06-S06 which were outside the linear calibration curve.
- L.3 The laboratory reported incorrect PQLs for several of the samples. The PQLs have been corrected on the data summary form by the reviewer.
- L.4 Some of the surrogate recoveries were calculated by the reviewer using peak height instead of area due to interference present in the samples, and in select samples the laboratory did not report surrogate recoveries due again to excessive interference present in the samples. Refer to section H.2 for exact sample identification.
- L.5 The matrix spike and matrix spike duplicate recoveries as calculated by the reviewer were outside the QC criteria.
- L.6 All other data are considered valid and usable for all purposes.

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DATA VALIDATION REPORT

PROGRAM:

POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)

LABORATORY:

Friedman & Bruya, Inc. (Seattle, WA)

REVIEWER:

Keith Strout

ANALYSIS:

Gasoline by USEPA Method 8015M

MATRIX:

Soil

DATE:

May 25, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (FBI) (Seattle, WA) received 12 soil samples from the Point Lay site on August 23, 1993 (referenced chain of custody record No. 538) for gasoline analysis by the volatile organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for gasoline by USEPA Method 8015M (modified) (GC/FID) on August 28, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	<u>Lab Sample No.</u>	<u>Matrix</u>
LAY-AOC5-S01	417	Soil
LAY-AOC5-S02	419	Soil
LAY-AOC5-S03	421	Soil
LAY-AOC5-S04	423	Soil
LAY-AOC5-S05	425	Soil
LAY-AOC5-S06	427	Soil
LAY-AOC5-S07	429	Soil
LAY-BKGD-SD01	431	Soil
LAY-BKGD-S01	433	Soil
LAY-BKGD-S02	435	Soil
LAY-BKGD-S03	437	Soil
LAY-BKGD-S04	439	Soil

The following QC sample designations were included in project documentation: sample numbers LAY-AOC5-S01 and LAY-AOC5-S07 were designated as field replicates.

The analytical results for the soil samples were reported with an adjustment for moisture content.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared using the guidelines in the USEPA draft document "National Functional Guidelines for Organic Data Review" (December 1990), USEPA Method 8015M, and the Project Sampling and Analysis Plan.

It should be noted that all quantitation limits reported by the laboratory for project soil samples were higher than those specified in the Project Sampling and Analysis Plan. According to the laboratory, all soil samples were extracted in methanol before analysis, as required by the State of Alaska guidelines. It is the opinion of the reviewer that the quality of the data was not affected.

II. VALIDITY & COMMENTS:

A. <u>Technical Holding Times:</u>

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. <u>Initial Calibration:</u>

B.1 The laboratory analyzed a four point initial calibration on system 3-4 on August 24, 1993. The range of the initial calibration was from 100 ppb to 5000 ppb. All samples were quantitated using a linear regression curve calculated from the initial calibration. A percent relative standard deviation (%RSD) of 27.4 was calculated using calibration factors determined from the initial calibration. The 27.4% RSD exceeds the recommended 20.0% RSD, therefore, the detected results for gasoline in all of the project samples are qualified "J" as estimated and are usable for limited purposes.

C. <u>Continuing Calibrations:</u>

C.1 The laboratory did not perform any continuing calibrations for the gasoline fraction. The laboratory indicated that since the same injection was used to analyze for gasoline and the BTEX compounds, the continuing calibration response on the FID for the BTEX compounds and the surrogate were used to determine linearity for the gasoline fraction. It is the opinion of the reviewer that the laboratory should have run continuing calibrations for the gasoline fraction, however, the response for the BTEX compounds and the surrogate compound can be used to determine if the instrument has maintained linearity for the gasoline fraction. Because the laboratory did not perform any continuing calibrations specifically for the gasoline fraction, the detected results and the practical quantitation limits (PQLs) are qualified "J" as estimated and are usable for limited purposes.

C.2 All QC criteria for the BTEX continuing calibrations were met and the results are considered acceptable.

D. <u>Laboratory Blanks:</u>

D.1 Gasoline was not detected in the method blanks at a concentration above the PQL and the results are considered acceptable.

E. Instrument Blanks:

E.1 Gasoline was not detected in the instrument blanks at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 There were no field blank analyses associated with this project sample set.

G. <u>Field Replicate Analysis:</u>

- G.1 A QC limit for precision of \leq 50%, as measured by Relative Percent Difference (RPD) between soil sample values, was specified for field replicate comparability.
- G.2 Samples LAY-AOC5-S01 and LAY-AOC5-S07 were utilized for field replicate analysis. The results of the field replicate analyses, as reported by the laboratory, met all applicable QC criteria and the results are considered acceptable.

H. Surrogate Recoveries:

H.1 All surrogate recoveries met applicable QC criteria and the results are considered acceptable.

I. Matrix Spike/Matrix Spike Duplicate Analyses:

1.1 The laboratory did not perform any matrix spike/matrix spike duplicate analyses for the gasoline fraction.

J. <u>System Performance:</u>

- J.1 The laboratory did not perform any instrument blanks between some of the samples which contained high levels of gasoline. It is the opinion of the reviewer that this resulted in carryover causing interference with the quantitation of some of the samples. Therefore, the detected result for gasoline in sample numbers LAY-AOC5-S01 and LAY-AOC5-S07 are qualified "J" as estimated and usable for limited purposes.
- J.2 No other problems with system performance were observed for the project sample analyses.

K. Quantitation and Identification:

K.1 The laboratory reported a detected result for gasoline in samples LAY-AOC5-S01, LAY-AOC5-S06, and LAY-AOC5-S07 and indicated that the detected results may be due to diesel fuel. It is the opinion of the reviewer that the detected peaks in sample LAY-AOC5-S06 are probably due to higher molecular weight hydrocarbons, and the detected peaks in samples LAY-AOC5-S01 and LAY-AOC5-S07 are probably due to a combination of higher molecular weight hydrocarbons and carryover from a previous sample. Therefore, the detected results for gasoline

in these samples are qualified "J" as estimated and usable for limited purposes.

K.2 No other problems were observed with compound quantitation and identification.

L. <u>Conclusion:</u>

- L.1 Due to the large percent RSD in the initial calibration and the lack of continuing calibrations for the gasoline fraction, the detected results and the PQL for gasoline in all project samples and blanks are qualified "J" as estimated and usable for limited purposes.
- L.2 Due to carryover and the presence of higher molecular weight hydrocarbons, the detected results in sample numbers LAY-AOC5-S01, LAY-AOC5-S06, and LAY-AOC5-S07 are qualified "J" as estimated and usable for limited purposes.

ICF KAISER ENGINEERS, INC. 2700 CHANDLER AVENUE, BUILDING C LAS VEGAS, NV 89120 702/795-0515

DATA VALIDATION REPORT

PROGRAM:

POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)

LABORATORY:

Friedman & Bruya, Inc. (Seattle, WA)

REVIEWER:

Keith Strout

ANALYSIS:

Gasoline by USEPA Method 8015M

MATRIX:

Water and Soil

DATE:

May 18, 1994

I. <u>INTRODUCTION:</u>

Friedman & Bruya, Inc. (FBI) (Seattle, WA) received 3 soil and 4 water samples from the Point Lay site on August 23, 1993 (referenced chain of custody record No. 537). All of the samples required gasoline analysis by the volatile organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for gasoline by USEPA Method 8015M (modified) (GC/FID) on August 24 through August 27, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	<u>Matrix</u>
LAY-TB-01	441	Water
LAY-EB-01	443	Water
LAY-BKGD-SW01	448	Water
LAY-BKGD-SW02	461	Water
LAY-AOC5-SD01	463	Soil
LAY-AOC5-SD02	465	Soil
LAY-AOC5-SD03	467	Soil

The following QC sample designations were included in project documentation: sample number LAY-TB-01 was designated as a travel blank and sample number LAY-EB-01 was designated as an equipment blank.

The analytical results for the soil samples were reported with an adjustment for moisture content.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared using the guidelines in the USEPA draft document "National Functional Guidelines for Organic Data Review" (December 1990), USEPA Method 8015M, and the Project Sampling and Analysis Plan.

It should be noted that all quantitation limits reported by the laboratory for project soil samples were higher than those specified in the Project Sampling and Analysis Plan. According to the laboratory, all soil samples were extracted in methanol before analysis, as required by the State of Alaska guidelines. It is the opinion of the reviewer that the quality of the data was not affected.

II. VALIDITY & COMMENTS:

A. <u>Technical Holding Times:</u>

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. <u>Initial Calibration:</u>

B.1 The laboratory analyzed a four point initial calibration on system 1-2 on August 19, 1993. The range of the initial calibration was from 50 ppb to 5000 ppb. All samples were quantitated using a linear regression curve calculated from the initial calibration. A percent relative standard deviation (%RSD) of 31.8 was calculated using calibration factors determined from the initial calibration. The 31.8% RSD exceeds the recommended 20.0% RSD, therefore, the detected results for gasoline in all of the samples analyzed on system 1-2 are qualified "J" as estimated and are usable for limited purposes.

B.2 The laboratory analyzed a four point initial calibration on system 3-4 on August 24, 1993. The range of the initial calibration was from 100 ppb to 5000 ppb. All samples were quantitated using a linear regression curve calculated from the initial calibration. A percent relative standard deviation (%RSD) of 27.4 was calculated using calibration factors determined from the initial calibration. The 27.4% RSD exceeds the recommended 20.0% RSD, therefore, the detected results for gasoline in all of the samples analyzed on system 3-4 are qualified "J" as estimated and are usable for limited purposes.

C. <u>Continuing Calibrations:</u>

C.1 The laboratory did not perform any continuing calibrations for the gasoline fraction. The laboratory indicated that since the same injection was used to analyze for gasoline and the BTEX compounds, the continuing calibration response on the FID for the BTEX compounds and the surrogate were used to determine linearity for the gasoline fraction. It is the opinion of the reviewer that the laboratory should have run continuing calibrations for the gasoline fraction, however, the response for the BTEX compounds and the surrogate compound can be used to determine if the instrument has maintained linearity for the gasoline fraction. Because the laboratory did not perform any continuing calibrations specifically for the gasoline fraction, the detected results and the practical quantitation limits (PQLs) are qualified "J" as

estimated and are usable for limited purposes.

C.2 All QC criteria for the BTEX continuing calibrations were met and the results are considered acceptable.

D. <u>Laboratory Blanks:</u>

D.1 Gasoline was not detected in the method blanks at a concentration above the PQL and the results are considered acceptable.

E. Instrument Blanks:

E.1 Gasoline was not detected in the instrument blanks at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

- F.1 Sample number LAY-TB-01 was designated as a travel blank and sample number LAY-EB-01 was designated as an equipment blank.
- F.2 Gasoline was not detected in the travel blank at a concentration above the PQL and the results are considered acceptable.
- F.3 Gasoline was not detected in the equipment blank at a concentration above the PQL and the results are considered acceptable.

G. Field Replicate Analysis:

G.1 There were no field replicate samples associated with this project sample set.

H. Surrogate Recoveries:

H.1 All surrogate recoveries met applicable QC criteria and the results are considered acceptable.

I. Matrix Spike/Matrix Spike Duplicate Analyses:

1.1 The laboratory did not perform any matrix spike/matrix spike duplicate analyses for the gasoline fraction.

J. System Performance:

J.1 No problems with system performance were observed for the project samples.

K. Quantitation and Identification:

K.1 The laboratory reported a detected result for gasoline in sample number LAY-AOC5-SD02. The reported result for gasoline in this sample is from an analysis performed on August 24, 1993 which contained carryover from a previous high level sample. The laboratory reanalyzed this sample on August 27, 1993 and gasoline was not present in the sample at a concentration above the PQL. Therefore, the result for gasoline in sample number LAY-AOC5-SD02 has been changed on the data summary form to reflect that gasoline was not detected at a concentration above the PQL.

- K.2 The low point in the gasoline initial calibration performed on August 24, 1993 was 100 ppb. Therefore, the PQL for gasoline in all of the water samples and blanks analyzed on system 3-4 has been raised from 50 ppb to 100 ppb, and the PQL for gasoline in all of the soil samples and blanks analyzed on system 3-4 has been raised from 1 ppm to 2 ppm.
- K.3 No other problems were observed with compound quantitation and identification.

L. Conclusion:

- L.1 Due to the large percent RSDs in the initial calibrations and the lack of continuing calibrations, the detected results and the PQL for all project samples and blanks are qualified "J" as estimated and usable for limited purposes.
- L.2 Due to carryover from a previous sample, the laboratory reanalyzed sample number LAY-AOC5-SD02. However, the laboratory inadvertently reported the results from the contaminated analysis. Therefore, the data summary form has been changed by the reviewer to contain the results from the reanalysis.
- L.3 The PQL for gasoline in all samples and blanks analyzed on system 3-4 has been changed to coincide with the low point in the initial calibration performed on August 24, 1993.

ICF KAISER ENGINEERS, INC. 2700 CHANDLER AVENUE, BUILDING C LAS VEGAS, NV 89120 702/795-0515

DATA VALIDATION REPORT

PROGRAM:

POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)

LABORATORY:

Friedman & Bruya, Inc. (Seattle, WA)

REVIEWER:

Keith Strout

ANALYSIS:

Gasoline by USEPA Method 8015M

MATRIX:

Soil

DATE:

May 26, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (FBI) (Seattle, WA) received 15 soil samples from the Point Lay site on August 24, 1993 (referenced chain of custody record No. 542). All of the samples required gasoline analysis by the volatile organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for gasoline by USEPA Method 8015M (modified) (GC/FID) on August 26 and August 27, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	<u>Matrix</u>
LAY-AOC4-SD01	628	Soil
LAY-AOC4-SD02	630	Soil
LAY-AOC4-SD03	632	Soil
LAY-AOC4-SD04	634	Soil
LAY-SS06-S01	636	Soil
LAY-SS06-S02	638	Soil
LAY-SS06-S03	640	Soil
LAY-SS06-S04	642	Soil
LAY-SS06-S05	644	Soil
LAY-SS06-S06	646	Soil
LAY-SS06-S07	648	Soil
LAY-SS06-S08	650	Soil

ICF Site No.	<u>Lab Sample No.</u>	<u>Matrix</u>
LAY-SS06-S09	652	Soil
LAY-SS06-S10	654	Soil
LAY-SS06-S11	656	Soil

The following QC sample designation was included in project documentation: sample numbers LAY-SS06-S09 and LAY-SS06-S01 were designated as field replicates, and sample numbers LAY-SS06-S07 and LAY-SS06-S10 were also designated as field replicates.

The analytical results for soils were reported with an adjustment for moisture content.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared using the guidelines in the USEPA draft document "National Functional Guidelines for Organic Data Review" (December 1990), USEPA Method 8015M, and the Project Sampling and Analysis Plan.

It should be noted that all quantitation limits reported by the laboratory for project soil samples were higher than those specified in the Project Sampling and Analysis Plan. According to the laboratory, all soil samples were extracted in methanol before analysis, as required by the State of Alaska guidelines. It is the opinion of the reviewer that the quality of the data was not affected.

II. VALIDITY & COMMENTS:

A. <u>Technical Holding Times:</u>

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. <u>Initial Calibration</u>:

B.1 The laboratory analyzed a four point initial calibration on system 1-2 on August 19, 1993. The range of the initial calibration was from 50 ppb to 5000 ppb. All samples were quantitated using a linear regression curve calculated from the initial calibration. A percent relative standard deviation (%RSD) of 31.8 was calculated using calibration factors determined from the initial calibration. The 31.8% RSD exceeds the recommended 20.0% RSD, therefore, the detected results for gasoline in all of the samples are qualified "J" as estimated and are usable for limited purposes.

C. <u>Continuing Calibrations:</u>

C.1 The laboratory did not perform any continuing calibrations for the gasoline fraction. The laboratory indicated that since the same injection was used to analyze for gasoline and the BTEX compounds, the continuing calibration response on the FID for the BTEX compounds and the surrogate were used to determine linearity for the gasoline fraction. It is the opinion of the reviewer that the laboratory should have run continuing calibrations for the gasoline fraction, however, the response for the BTEX compounds and the surrogate compound can be used to determine if the instrument has maintained linearity for the gasoline fraction. Because the laboratory

did not perform any continuing calibrations specifically for the gasoline fraction, the detected results and the practical quantitation limits (PQLs) are qualified "J" as estimated and are usable for limited purposes.

C.2 All QC criteria for the BTEX continuing calibrations were met and the results are considered acceptable.

D. <u>Laboratory Blanks:</u>

D.1 Gasoline was not detected in the method blanks at a concentration above the PQL and the results are considered acceptable.

E. <u>Instrument Blanks:</u>

E.1 Gasoline was not detected in the instrument blanks at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 There were no field blanks submitted with this project sample set.

G. <u>Field Replicate Analysis:</u>

- G.1 A QC limit for precision of \leq 50%, as measured by Relative Percent Difference (RPD) between soil sample values, was specified for field replicate comparability.
- G.2 Sample numbers LAY-SS06-S09 and LAY-SS06-S01 were utilized for field replicate analysis. The results of the field replicate analyses (70% RPD) exceeded the QC criteria. It is not known what effect, if any, this will have on the quality of the data.
- G.3 Sample numbers LAY-SS06-S07 and LAY-SS06-S10 were also utilized for field replicate analysis. The results of the field replicate analyses met all applicable QC criteria and the results are considered acceptable.

H. <u>Surrogate Recoveries:</u>

H.1 All of the surrogate QC recovery criteria were met for all project samples and the results are considered acceptable.

I. Matrix Spike/Matrix Spike Duplicate Analyses:

1.1 The laboratory did not perform any matrix spike/matrix spike duplicate analyses for the gasoline fraction.

J. System Performance:

J.1 The laboratory did not perform any instrument blanks between some of the samples which contained high levels of gasoline. It is the opinion of the reviewer that this resulted in carryover and created interference causing an elevated baseline in some of the samples which probably did not contain gasoline. Therefore, the PQL in sample numbers LAY-SS06-S03, LAY-SS06-S05, LAY-SS06-S07, LAY-SS06-S08, and LAY-SS06-S10 has been adjusted to compensate for the carryover.

J.2 No other problems with system performance were observed for the project sample analyses.

K. Quantitation and Identification:

K.1 Discrepancies exist between the detected amount of gasoline reported by the laboratory and the amount of gasoline calculated by the reviewer in some of the project samples. Listed below are the results reported by the laboratory and the results regenerated by the reviewer. The results are listed in parts per million (ppm).

ICF Site No.	<u>Laboratory Results</u>	Validation Results
LAY-SS06-S01	34	25
LAY-SS06-S09	<i>7</i> 1	48
LAY-SS06-S04	570	397
LAY-SS06-S06	500	316
LAY-SS06-S02	780	540
LAY-SS06-S11	220	150

It appears that the laboratory used an incorrect linear regression equation to quantitate the amount of gasoline in the samples. The detected results for these samples have been changed on the data summary forms by the reviewer.

- K.2 Because the laboratory did not analyze a sufficient number of instrument blanks, it is the opinion of the reviewer that carryover from samples containing high levels of gasoline may have contributed to the levels of gasoline detected in some of the project samples. Therefore, the detected results for gasoline in sample numbers LAY-SS06-S06, LAY-SS06-S02, and LAY-SS06-S11 are qualified "J" as estimated and usable for limited purposes.
- K.3 No other problems were observed with compound quantitation and identification.

L. Conclusion:

- L.1 Due to a large %RSD in the initial calibration and the lack of continuing calibrations for gasoline, all detected results and the PQL for all project samples are qualified "J" as estimated and usable for limited purposes.
- L.2 Due to carryover from previous analyses, the PQL for sample numbers LAY-SS06-S03, LAY-SS06-S05, LAY-SS06-S07, LAY-SS06-S08, and LAY-SS06-S10 has been raised by the reviewer.
- L.3 Due to carryover from previous analyses, the detected results for gasoline in some of the project samples may be artificially high.
- L.4 Due to discrepancies between the detected results reported by the laboratory and the results calculated by the reviewer, the detected results for gasoline in some of the project samples have been changed on the data summary forms by the reviewer.

ICF KAISER ENGINEERS, INC. 2700 CHANDLER AVENUE, BUILDING C LAS VEGAS, NV 89120 702/795-0515

DATA VALIDATION REPORT

PROGRAM:

POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)

LABORATORY:

Friedman & Bruya, Inc. (Seattle, WA)

REVIEWER:

Keith Strout

ANALYSIS:

HVOCs by USEPA Method 8010 and BTEX compounds by USEPA Method

8020

MATRIX:

Soil

DATE:

May 25, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (FBI) (Seattle, WA) received 12 soil samples from the Point Lay site on August 23, 1993 (referenced chain of custody record No. 538). All of the samples required analysis for the halogenated volatile organic compounds (HVOCs) and the BTEX compounds by the volatile organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed on August 28, 1993 for HVOCs by USEPA Method 8010, and BTEX compounds by USEPA Method 8020.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site_No.	<u>Lab Sample No.</u>	<u>Matrix</u>
LAY-AOC5-S01	417	Soil
LAY-AOC5-S02	419	Soil
LAY-AOC5-S03	421	Soil
LAY-AOC5-S04	423	Soil
LAY-AOC5-S05	425	Soil
LAY-AOC5-S06	427	Soil
LAY-AOC5-S07	429	Soil
LAY-BKGD-SD01	431	Soil
LAY-BKGD-S01	433	Soil
LAY-BKGD-S02	435	Soil
LAY-BKGD-\$03	437	Soil
LAY-BKGD-S04	439	Soil

The following QC sample designations were included in project documentation: sample numbers LAY-AOC5-S01 and LAY-AOC5-S07 were designated as field replicates.

The analytical results for the soil samples were reported with an adjustment for moisture content.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared using the guidelines in the USEPA draft document "National Functional Guidelines for Organic Data Review" (December 1990), USEPA Methods 8010 and 8020, and the Project Sampling and Analysis Plan.

It should be noted that all quantitation limits reported by the laboratory for HVOCs for project soil samples were higher than those specified in the Project Sampling and Analysis Plan. According to the laboratory, all soil samples were extracted in methanol before analysis, as required by the State of Alaska guidelines. It is the opinion of the reviewer that the quality of the data was not affected.

II. VALIDITY & COMMENTS:

A. <u>Technical Holding Times:</u>

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. <u>Initial Calibration:</u>

B.1 The laboratory analyzed a five point initial calibration on system 3-4 on August 24, 1993. The range of the initial calibration was from 1 ppb to 1000 ppb. All samples were quantitated using a linear regression curve calculated from the initial calibration. Percent relative standard deviations (%RSDs) were calculated for all compounds using the calibration factors from the initial calibration using the FID detector. The % RSDs for the following compounds exceeded the recommended QC criteria of 20.0%.

Compound	<u>% RSD</u>
ethylbenzene	23.2 %
m & p-xylene	22.6 %

Due to the large percent RSDs, the detected results for these compounds, when quantitated using the FID, in the associated samples and blanks are qualified "J" as estimated and are usable for limited purposes.

B.2 The laboratory analyzed a four point initial calibration on system 3-4 on August 29, 1993. The range of the initial calibration was from 1 ppb to 1000 ppb. All samples were quantitated using a linear regression curve calculated from the initial calibration. Percent relative standard deviations (%RSDs) were calculated for all compounds using the calibration factors from the initial calibration using the FID detector. The % RSDs for the following compounds exceeded the recommended QC criteria of 20.0%.

Compound	<u>% RSD</u>
toluene	26 %
ethylbenzene	53 %
m & p-xylene	41 %
o-xylene	28 %

Due to the large percent RSDs, the detected results for these compounds, when quantitated using the FID, in the associated samples and blanks are qualified "J" as estimated and are usable for limited purposes.

C. <u>Continuing Calibrations:</u>

C.1 All QC criteria for the continuing calibrations were met and the results are considered acceptable.

D. <u>Laboratory Blanks:</u>

D.1 No target analytes were detected in the method blanks at a concentration above the PQL and the results are considered acceptable.

E. Instrument Blanks:

E.1 No target analytes were detected in the instrument blanks at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 There were no field blanks submitted with this project sample set.

G. <u>Field Replicate Analysis:</u>

- G.1 A QC limit for precision of \leq 50%, as measured by Relative Percent Difference (RPD) between soil sample values, was specified for field replicate comparability.
- G.2 Samples LAY-AOC5-S01 and LAY-AOC5-S07 were utilized for field replicate analysis. The detected results for benzene and xylene in the field replicate analyses exceeded the QC criteria. It is the opinion of the reviewer that the large variability between these two samples is due to interference from carryover in a previous sample. The detected results for the other target analytes met all applicable QC criteria and the results are considered acceptable.

H. <u>Surrogate Recoveries:</u>

H.1 All surrogate recoveries met applicable QC criteria and the results are considered acceptable.

I. Matrix Spike/Matrix Spike Duplicate Analyses:

I.1 Sample number LON-SS01-S10-4 was used for the soil matrix spike/matrix spike duplicate analyses. This sample was from the Point Lonely site, not from the Point Lay site. It is the opinion of the reviewer that since the similarity of the soil type from each site is not described, it is not known what affect, if any, this will have on the quality of the data.

I.2 All of the matrix spike/matrix spike duplicate QC criteria were met and the results are considered acceptable.

J. System Performance:

- J.1 The laboratory did not perform any instrument blanks between some of the samples which contained high levels of hydrocarbons. It is the opinion of the reviewer that this resulted in carryover and created interference with the quantitation of the BTEX compounds.
- J.2 No other problems with system performance were observed for the project samples.

K. Quantitation and Identification:

- K.1 The laboratory did not perform any instrument blanks between sample numbers LAY-AOC5-S06, LAY-AOC5-S07, and LAY-AOC5-S01 which contained high levels of hydrocarbons. It is the opinion of the reviewer that this resulted in carryover and created interference with the identification and quantitation of the BTEX compounds. Therefore, the detected results and the PQLs for the BTEX compounds in sample numbers LAY-AOC5-S07 and LAY-AOC5-S01 are qualified "R" as rejected and are unusable.
- K.2 No other problems were observed with compound quantitation and identification.

- L.1 Due to large percent RSDs in the initial calibration, select data in some samples are qualified "J" as estimated and usable for limited purposes.
- L.2 Due to carryover from a previous sample, the detected results and the PQLs for the BTEX compounds in sample numbers LAY-AOC5-S07 and LAY-AOC5-S01 are qualified "R" as rejected and are unusable.
- L.3 All other data are considered valid and usable for all purposes.

ICF KAISER ENGINEERS, INC. 2700 CHANDLER AVENUE, BUILDING C LAS VEGAS, NV 89120 702/795-0515

DATA VALIDATION REPORT

PROGRAM:

POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)

LABORATORY:

Friedman & Bruya, Inc. (Seattle, WA)

REVIEWER:

Keith Strout

ANALYSIS:

HVOCs by USEPA Method 8010 and BTEX compounds by USEPA Method

8020

MATRIX:

Water and Soil

DATE:

May 18, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (FBI) (Seattle, WA) received 3 soil and 4 water samples from the Point Lay site on August 23, 1993 (referenced chain of custody record No. 537). All of the samples required analysis for halogenated volatile organic compounds (HVOCs) and the BTEX compounds by the volatile organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed on August 24 through August 27, 1993 for HVOCs by USEPA Method 8010, and BTEX compounds by USEPA Method 8020.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	<u>Matrix</u>
LAY-TB-01	441	Water
LAY-EB-01	443	Water
LAY-BKGD-SW01	448	Water
LAY-BKGD-SW02	461	Water
LAY-AOC5-SD01	463	Soil
LAY-AOC5-SD02	465	Soil
LAY-AOC5-SD03	467	Soil

The following QC sample designations were included in project documentation: sample number LAY-TB-01 was designated as a travel blank and sample number LAY-EB-01 was designated as an equipment blank.

The analytical results with qualifications are presented on modified sample data sheets

submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared using the guidelines in the USEPA draft document "National Functional Guidelines for Organic Data Review" (December 1990), USEPA Methods 8010 and 8020, and the Project Sampling and Analysis Plan.

The analytical results for the soil samples were reported with an adjustment for moisture content.

It should be noted that all quantitation limits reported by the laboratory for HVOCs for project soil samples were higher than those specified in the Project Sampling and Analysis Plan. According to the laboratory, all soil samples were extracted in methanol before analysis, as required by the State of Alaska guidelines. It is the opinion of the reviewer that the quality of the data was not affected.

II. VALIDITY & COMMENTS:

A. <u>Technical Holding Times:</u>

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:

B.1 The laboratory analyzed a five point initial calibration on system 1-2 on August 19, 1993. The range of the initial calibration was from 1 ppb to 1000 ppb. All samples were quantitated using a linear regression curve calculated from the initial calibration. Percent relative standard deviations (%RSDs) were calculated for all compounds using the calibration factors from the initial calibration using the FID detector. The % RSDs for the following compounds exceeded the recommended QC criteria of 20.0%.

<u>Compound</u>	<u>% RSD</u>
benzene	28.3 %
o-xylene	26.5 %

Due to the large percent RSDs, the detected results for these compounds in all project samples analyzed on system 1-2 when quantitated using the FID detector are qualified "J" as estimated and are usable for limited purposes.

B.2 The laboratory analyzed a five point initial calibration on system 3-4 on August 24, 1993. The range of the initial calibration was from 1 ppb to 1000 ppb. All samples were quantitated using a linear regression curve calculated from the initial calibration. Percent relative standard deviations (%RSDs) were calculated for all compounds using the calibration factors from the initial calibration using the FID detector. The % RSDs for the following compounds exceeded the recommended QC criteria of 20.0%.

Compound	<u>% RSD</u>
ethylbenzene	23.2 %
m & p-xylene	22.6 %

Due to the large percent RSDs, the detected results for these compounds in all

project samples analyzed on system 3-4 when quantitated using the FID detector are qualified "J" as estimated and are usable for limited purposes.

B.3 The laboratory was unable to demonstrate linearity throughout the quantitation range using the ECD detector on system 1-2 because the detector was saturated at low concentrations. It is the opinion of the reviewer that the ECD detector can be used only to confirm the presence of the halogenated compounds. Quantitation of the halogenated compounds should be done on the PID or FID detector when possible, and only if compound detection was confirmed on the ECD.

C. <u>Continuing Calibrations:</u>

- C.1 The continuing calibrations on system 1-2 were performed at a concentration of 100 ppb. At this concentration, the system 1-2 ECD response for all of the halogenated compounds, including the surrogate BFB, is saturated. The ECD detector on system 1-2 should only be used to confirm the presence of the halogenated compounds. Therefore, the PQL for the HVOC compounds in all samples and blanks analyzed on system 1-2 are qualified "J" as estimated and are usable for limited purposes.
- C.2 All other QC criteria for the continuing calibrations were met and the results are considered acceptable.
- D. <u>Laboratory Blanks:</u>
 - D.1 No target analytes were detected in the method blanks at a concentration above the PQL and the results are considered acceptable.
- E. <u>Instrument Blanks:</u>
 - E.1 No target analytes were detected in the instrument blanks at a concentration above the PQL and the results are considered acceptable.
- F. Field Blanks:
 - F.1 Sample number LAY-TB-01 was designated as a travel blank and sample number LAY-EB-01 was designated as an equipment blank.
 - F.2 No target analytes were detected in the travel blank at a concentration above the PQL and the results are considered acceptable.
 - F.3 No target analytes were detected in the equipment blank at a concentration above the PQL and the results are considered acceptable.
- G. Field Replicate Analysis:
 - G.1 There were no field replicate samples associated with this project sample set.
- H. <u>Surrogate Recoveries:</u>
 - H.1 All of the surrogate QC recovery criteria were met and the results are considered acceptable.

- I. Matrix Spike/Matrix Spike Duplicate Analyses:
 - 1.1 Sample number BTR-LF12-S03, which is not part of this project sample set but is from the Barter Island site, was used for the matrix spike/matrix spike duplicate analyses.
 - 1.2 The recovery for tetrachloroethylene in the matrix spike duplicate analysis was 179% which exceeds the matrix spike recovery QA criteria. The analytical results are not qualified solely on the results of the matrix spike analyses.
 - 1.3 All of the other matrix spike/matrix spike duplicate QC criteria were met and the results are considered acceptable.

J. <u>System Performance:</u>

- J.1 The ECD detector on system 1-2 was saturated at the concentration level of the continuing calibrations and should only be used to confirm the presence of the HVOC compounds.
- J.2 No other problems with system performance were observed for the project samples.

K. Quantitation and Identification:

- K.1 The laboratory reported detected results for toluene, ethylbenzene, and xylene in sample number LAY-AOC5-SD02. The reported results for these analytes in this sample are from an analysis performed on August 24, 1993 which contained carryover from a previous high level sample. The laboratory reanalyzed this sample on August 27, 1993 and these analytes were not present in the sample at a concentration above the PQLs. Therefore, the results for toluene, ethylbenzene, and xylene in sample number LAY-AOC5-SD02 have been changed on the data summary form to reflect that these analytes were not detected at a concentration above the PQLs.
- K.2 No other problems were observed with compound quantitation and identification.

- L.1 Due to performance problems with the ECD on system 1-2, the PQL for the HVOC compounds in all samples and blanks analyzed on system 1-2 are qualified "J" as estimated and usable for limited purposes.
- L.2 Due to carryover from a previous sample, the laboratory reanalyzed sample number LAY-AOC5-SD02. However, the laboratory inadvertently reported the results from the contaminated analysis. Therefore, the data summary form has been changed by the reviewer to contain the results from the reanalysis.
- L.3 Due to large percent RSDs in the initial calibration, select data in some samples are qualified "J" as estimated and usable for limited purposes.
- L.4 All other data are considered valid and usable for all purposes.

ICF KAISER ENGINEERS, INC. 2700 CHANDLER AVENUE, BUILDING C LAS VEGAS, NV 89120 702/795-0515

DATA VALIDATION REPORT

PROGRAM:

POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)

LABORATORY:

Friedman & Bruya, Inc. (Seattle, WA)

REVIEWER:

Keith Strout

ANALYSIS:

HVOCs by USEPA Method 8010 and BTEX compounds by USEPA Method

8020

MATRIX:

Soil

DATE:

May 26, 1994

I. <u>INTRODUCTION</u>:

Friedman & Bruya, Inc. (FBI) (Seattle, WA) received 15 soil samples from the Point Lay site on August 24, 1993 (referenced chain of custody record No. 542). Eleven of the samples required analysis for the halogenated volatile organic compounds (HVOCs), and all of the samples required analysis for the BTEX compounds by the volatile organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The laboratory analyzed the samples for HVOCs by USEPA Method 8010 and the BTEX compounds by USEPA Method 8020 on August 26 and August 27, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	<u>Matrix</u>
LAY-AOC4-SD01	628	Soil
LAY-AOC4-SD02	630	Soil
LAY-AOC4-SD03	632	Soil
LAY-AOC4-SD04	634	Soil
LAY-SS06-S01	636	Soil
LAY-SS06-S02	638	Soil
LAY-SS06-S03	640	Soil
LAY-SS06-S04	642	Soil
LAY-SS06-S05	644	Soil
LAY-SS06-S06	646	Soil
LAY-SS06-S07	648	Soil
LAY-SS06-S08	650	Soil

ICF Site No.	<u>Lab Sample No.</u>	<u>Matrix</u>
LAY-SS06-S09	652	Soil
LAY-SS06-S10	654	Soil
LAY-SS06-S11	656	Soil

The following QC sample designation was included in project documentation: sample numbers LAY-SS06-S09 and LAY-SS06-S01 were designated as field replicates, and sample numbers LAY-SS06-S07 and LAY-SS06-S10 were also designated as field replicates.

The analytical results for the soil samples were reported with an adjustment for moisture content.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared using the guidelines in the USEPA draft document "National Functional Guidelines for Organic Data Review" (December 1990), USEPA Methods 8010 and 8020, and the Project Sampling and Analysis Plan.

It should be noted that all quantitation limits reported by the laboratory for HVOCs for project soil samples were higher than those specified in the Project Sampling and Analysis Plan. According to the laboratory, all soil samples were extracted in methanol before analysis, as required by the State of Alaska guidelines. It is the opinion of the reviewer that the quality of the data was not affected.

II. VALIDITY & COMMENTS:

A. <u>Technical Holding Times:</u>

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. <u>Initial Calibration</u>:

B.1 The laboratory analyzed a five point initial calibration on system 1-2 on August 19, 1993. The range of the initial calibration was from 1 ppb to 1000 ppb. All samples were quantitated using a linear regression curve calculated from the initial calibration. Percent relative standard deviations (%RSDs) were calculated for all compounds using the calibration factors from the initial calibration using the FID detector. The % RSDs for the following compounds exceeded the recommended QC criteria of 20.0%.

<u>Compound</u>	<u>% RSD</u>	
benzene	28.3 %	
o-xylene	26.5 %	

Due to the large percent RSDs, the detected results for these compounds in all project samples are qualified "J" as estimated and are usable for limited purposes.

B.2 The laboratory was unable to demonstrate linearity throughout the

quantitation range using the ECD detector because the detector was saturated at low concentrations. It is the opinion of the reviewer that the ECD detector can be used only to confirm the presence of the halogenated compounds. Quantitation of the halogenated compounds should have been done on the PID or FID detector when possible, and only if compound detection was confirmed on the ECD. Therefore, the detected results and the practical quantitation limits (PQLs) for the halogenated compounds are qualified "J" as estimated and usable for limited purposes.

C. <u>Continuing Calibrations:</u>

- C.1 The continuing calibrations were performed at a concentration of 500 ppb. At this concentration, the ECD response for all of the halogenated compounds is saturated. Therefore, the ECD detector should only be used to confirm the presence of the halogenated compounds.
- C.2 All other QC criteria for the continuing calibrations were met and the results are considered acceptable.

D. <u>Laboratory Blanks:</u>

D.1 No target analytes were detected in the method blanks at a concentration above the PQL and the results are considered acceptable.

E. <u>Instrument Blanks:</u>

E.1 No target analytes were detected in the instrument blanks at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 There were no field blanks submitted with this project sample set.

G. Field Replicate Analysis:

- G.1 A QC limit for precision of \leq 50%, as measured by Relative Percent Difference (RPD) between soil sample values, was specified for field replicate comparability.
- G.2 Sample numbers LAY-SS06-S09 and LAY-SS06-S01 were utilized for field replicate analysis. The results of the field replicate analyses for target analytes 1,1,1-trichloroethane, trichloroethylene, toluene, tetrachloroethylene, ethylbenzene, and xylene exceeded the QC criteria. It is not known what effect, if any, this will have on the quality of the data.
- G.3 Sample numbers LAY-SS06-S07 and LAY-SS06-S10 were also utilized for field replicate analysis. The results of the field replicate analyses met all applicable QC criteria and the results are considered acceptable.

H. Surrogate Recoveries:

H.1 All surrogate recoveries met applicable QC criteria and the results are considered acceptable.

I. <u>Matrix Spike/Matrix Spike Duplicate Analyses:</u>

- I.1 Sample number LAY-SS06-S07 was used for the matrix spike/matrix spike duplicate analyses.
- 1.2 All of the matrix spike/matrix spike duplicate QC criteria were met and the results are considered acceptable.

J. <u>System Performance:</u>

- J.1 It is the opinion of the reviewer that the ECD detector cannot be used for the quantitation of the halogenated compounds because the detector displayed saturation at low concentrations. The ECD detector can be used for halogenated compound identification confirmation.
- J.2 The laboratory did not perform any instrument blanks between some of the samples which contained high levels of BTEX compounds. It is the opinion of the reviewer that this resulted in carryover and created interference causing an elevated baseline in some of the samples which probably did not contain BTEX compounds. Therefore, the PQLs for some of the BTEX compounds in sample numbers LAY-SS06-S05, LAY-SS06-S07, LAY-SS06-S10, and LAY-SS06-S06 have been adjusted to compensate for the carryover.
- J.3 No other problems with system performance were observed for the project samples.

K. Quantitation and Identification:

K.1 Discrepancies exist between the detected amount reported by the laboratory and the amount calculated by the reviewer for certain target analytes in some of the project samples. Listed below are the detected results reported by the laboratory and the results regenerated by the reviewer for the analytes where discrepancies exist. Results are listed in parts per million (ppm).

ICF Site No.	Analyte	<u>Laboratory Result</u>	<u>Validation Result</u>
LAY-SS06-S03	tetrachloroethylene	21	1
LAY-SS06-S04	toluene	2	4
	ethylbenzene	7	14
	xylene	19	42
LAY-SS06-S02	toluene	1	3

The laboratory indicated that discrepancies are probably due to inconsistent quantitation procedures. The laboratory was unable to reproduce some of the reported detected results for which indicates that inconsistent quantitation procedures may have been used.

K.2 Because the laboratory did not analyze a sufficient number of instrument blanks, it is the opinion of the reviewer that carryover from samples containing high levels of organics may have contributed to the levels of target analytes detected in

some of the project samples. Therefore, the detected results for the BTEX compounds in sample numbers LAY-SS06-S06, LAY-SS06-S02, and LAY-SS06-S11 are qualified "J" as estimated and usable for limited purposes.

- K.3 Compound identification was confirmed using a second column and an alternate detector.
- K.4 No other problems were observed for compound quantitation and identification.

- L.1 Due to large percent RSDs in the initial calibration, select data in some samples are qualified "J" as estimated and usable for limited purposes.
- L.2 Due to carryover from previous analyses, the PQLs for some of the BTEX compounds in sample numbers LAY-SS06-S05, LAY-SS06-S07, LAY-SS06-S10, and LAY-SS06-S06 have been raised by the reviewer on the data summary forms.
- L.3 Due to carryover from previous analyses, the detected results for some of the BTEX compounds in some of the project samples may be artificially high.
- L.4 All other data are considered valid and usable for all purposes.



ICF KAISER ENGINEERS, INC. 2700 CHANDLER AVENUE, BUILDING C LAS VEGAS, NV 89120 702/795-0515

DATA VALIDATION REPORT

PROGRAM:

POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)

LABORATORY:

Friedman & Bruya, Inc. (Seattle, WA)

REVIEWER:

Clyde Hedin

ANALYSIS:

Pesticides by USEPA Method 8080

MATRIX:

Water

DATE:

June 16, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (Seattle, WA) received 11 water samples from the Point Lay site on August 24, 1993 (referenced chain of custody record No. 545) were requested for pesticide analysis by the pesticide organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for pesticides by USEPA Method 8080 on August 27, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	<u>Lab Sample No.</u>	<u>Matrix</u>
LAY-EB02	557	Water
LAY-LF01-SW04	562	Water
LAY-LF01-SW08	565	Water

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document "National Functional Guidelines for Organic Data Review", December 1990, and the analytical guidelines in USEPA Method 8080, and the Project Sampling and Analysis Plan.

The following QC sample designations were included in project documentation: sample numbers LAY-LF01-SW04 and LAY-LF01-SW08 were designated as field duplicates.

II. VALIDITY & COMMENTS:

DLPL\8080\COC545\FBPST034.DVR

A. <u>Technical Holding Times:</u>

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. <u>Initial Calibration:</u>

B.1 The laboratory performed a five point initial calibration on GC instrument ICF5 on August 21, 1993. The range of the initial calibration was from 0.01 ppm to 1.0 ppm. The percent relative standard deviations (%RSDs) were calculated for all compounds using calibration factors determined from the initial calibration using the ECD detector. The %RSDs for the following target analytes exceeded the recommended QC criteria of 20.0%.

Compound %RSD Beta-BHC 21.7

All detected results for this analyte in the samples are qualified "J" as estimated and usable for limited purposes.

B.2 Methoxychlor was spiked in at concentrations too low to be detected by the ECD detector until the 0.5 ppm initial calibration standard. All detected results for this analyte are qualified "R" as rejected and unusable, and the PQL is adjusted accordingly.

C. <u>Continuing Calibration:</u>

C.1 No continuing calibrations were analyzed during the sequence with the exception of the column degradation solution containing Endrin and DDT. The stability of the instrument, GC column, and detector were monitored using the Endrin, and DDT column degradation solution and the Aroclor 1254 continuing calibration calibration solution. These two solutions were used to check area consistency and surrogate area stability. It is the opinion of the reviewer, that since no pesticide continuing calibration solutions were analyzed, this is the only criteria that can be used to monitor system performance.

Due to the absence of pesticide continuing calibrations, the PQLs for all method blanks and samples are qualified "J" as estimated and usable for limited purposes.

D. Laboratory Blanks:

D.1 There were no laboratory blanks submitted for analyses with the pesticide fraction.

E. Instrument Blanks:

E.1 Target analytes were not detected in the instrument blank at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 There were no field blanks submitted for analyses with the pesticide fraction.

G. Field Duplicate Analyses:

G.1 A QC limit for precision of ≤20%, as measured by Relative Percent Difference (RPD) between water sample values, was specified for field duplicate

comparability.

G.2 Samples LAY-LF01-SW04 and LAY-LF01-SW08 were utilized for field duplicate analysis. The results of the field duplicate analyses met all applicable QC criteria and the results are considered acceptable.

H. <u>Surrogate Recoveries:</u>

H.1 All surrogate recoveries met QC criteria and the results are considered acceptable.

I. <u>Matrix Spike/Matrix Spike Duplicate:</u>

1.1 No matrix spike and matrix spike duplicate analyses were performed for the pesticide fraction.

J. System Performance:

- J.1 The laboratory set up the GC analytical run time on the primary GC column to elute all pesticide analytes within 9 minutes, causing co-elution of numerous pesticides and making identification difficult. A slower temperature program and/or slower carrier gas flow rate would increase resolution for many of the pesticide analytes.
- J.2 The Endrin and 4,4'-DDT breakdown met QC criteria and the results are considered acceptable.
- J.3 No other problems with system performance were observed for all other project sample analyses.

K. Quantitation and Identification:

- K.1 Due to the absence of pesticide continuing calibrations, all PQLs for the project method blank and samples are qualified "J" as estimated and usable for limited purposes.
- K.2 The PQLs for all pesticide analytes in all project samples were reported incorrectly. The reviewer corrected the pesticide PQLs on the data summary report forms.
- K.3 No other problems with compound quantitation and identification were observed.

- L.1 No target analytes were detected at a concentration above the PQLs in the method blank and the samples.
- L.2 Due to the absence of pesticide continuing calibrations, all PQLs for the project method blank and samples are qualified "J" as estimated and usable for limited purposes.
- L.3 The PQLs for all pesticide analytes in all project samples were reported incorrectly. The reviewer corrected the pesticide PQLs on summary report forms.

ICF KAISER ENGINEERS, INC. 2700 CHANDLER AVENUE, BUILDING C LAS VEGAS, NV 89120 702/795-0515

DATA VALIDATION REPORT

PROGRAM:

POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)

LABORATORY:

Friedman & Bruya, Inc. (Seattle, WA)

REVIEWER:

Timothy Vonnahme

ANALYSIS:

Pesticides by USEPA Method 8080

MATRIX:

Soil

DATE:

June 3, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (Seattle, WA) received 12 soil samples from the Point Lay site on August 23, 1993 (referenced chain of custody record No. 538). Seven of the samples were requested for pesticide analysis by the pesticide organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for pesticides by USEPA Method 8080 on August 24, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	<u>Lab Sample No.</u>	<u>Matrix</u>
LAY-AOC5-S01	417	Soil
LAY-AOC5-S07	429	Soil
LAY-BKGD-SD01	431	Soil
LAY-BKGD-S01	433	Soil
LAY-BKGD-S02	435	Soil
LAY-BKGD-S03	437	Soil
LAY-BKGD-S04	439	Soil

The quantitation limits reported by the laboratory for the soil samples (0.02 ppm) were lower than those specified in the Project Sampling and Analysis Plan (0.05 ppm). It is the opinion of the reviewer that the quality of the data was not affected.

The following QC sample designations were included in project documentation: sample numbers LAY-AOC5-S01 and LAY-AOC5-S07 were designated as field replicates.

The analytical results for the soil samples were reported with an adjustment for moisture content.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document "National Functional Guidelines for Organic Data Review", December 1990, and the analytical guidelines in USEPA Method 8080, and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. <u>Technical Holding Times:</u>

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. <u>Initial Calibration:</u>

B.1 The laboratory performed a five point initial calibration on GC instrument ICF5 on August 21, 1993. The range of the initial calibration was from 0.01 ppm to 1.0 ppm. The percent relative standard deviations (%RSDs) were calculated for all compounds using calibration factors determined from the initial calibration using the ECD detector. The %RSD for the following target analyte exceeded the recommended QC criteria of 20.0%

Compound	%RSD
beta-BHC	22%

All detected results for beta-BHC in the samples are qualified "J" as estimated and usable for limited purposes.

B.2 Methoxychlor was spiked in at concentrations too low to be detected by the ECD detector until the 0.5 ppm initial calibration standard. All detected results for this analyte are qualified "R" as rejected and unusable, and the PQL is adjusted accordingly.

C. <u>Continuing Calibration:</u>

C.1 No continuing calibrations were analyzed during the sequence with the exception of the column degradation solution containing Endrin and DDT. The stability of the instrument, GC column, and detector were monitored using the Endrin and DDT column degradation solution and the Aroclor 1254 continuing calibration solution. These two solutions were used to check area consistency and surrogate area stability. It is the opinion of the reviewer, that since no pesticide continuing calibration solutions were analyzed, this is the only criteria that can be used to monitor system performance.

Due to the absence of pesticide continuing calibrations, the practical quantitation limits (PQLs) for all method blanks and samples are qualified "J" as estimated and

usable for limite d purposes.

D. <u>Laboratory Blanks:</u>

D.1 The laboratory did not report the pesticide results for the method blank associated with this sample set. The reviewer modified the sample report summary form to included the pesticide results for the soil method blank. Target analytes were not detected in the method blank at a concentration above the PQL and the results are considered acceptable.

E. Instrument Blanks:

E.1 Target analytes were not detected in the instrument blank at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 There were no field blank analyses associated with this project sample set.

G. Field Replicate Analyses:

- G.1 A QC limit for precision of \leq 50%, as measured by Relative Percent Difference (RPD) between soil sample values, was specified for field replicate comparability.
- G.2 Samples LAY-AOC5-S01 and LAY-AOC5-S07 were utilized for field replicate analysis. The results of the field replicate analyses, as reported by the laboratory, met all applicable QC criteria and the results are considered acceptable.

H. <u>Surrogate Recoveries:</u>

H.1 All surrogate recoveries met QC criteria and the results are considered acceptable.

I. <u>Matrix Spike/Matrix Spike Duplicate:</u>

1.1 No matrix spike and matrix spike duplicate analyses were performed for the pesticide fraction.

J. System Performance:

- J.1 The laboratory set up the GC analytical run time on the primary GC column to elute all pesticide analytes within 9 minutes, causing co-elution of numerous pesticides and making identification difficult. A slower temperature program and/or slower carrier gas flow rate would increase resolution for many of the pesticide analytes.
- J.2 The Endrin and 4,4'-DDT breakdown met QC criteria and the results are considered acceptable.
- J.3 No other problems with system performance were observed for all other project sample analyses.

K. Quantitation and Identification:

K.1 Due to the absence of pesticide continuing calibrations, all PQLs for the project method blank and samples are qualified "J" as estimated and usable for limited purposes.

- K.2 Due to biological interference present in all the samples, the PCLs have been raised to 0.02 ppb by the laboratory.
- K.3 Due to sensitivity problems with methoxychlor in the initial calibration, the PQL was raised by the reviewer to 0.5 ppb for the soil samples.
- K.4 No other problems with compound quantitation and identification were observed.

- L.1 No target analytes were detected at a concentration above the PQLs in the method blank and the samples.
- L.2 Due to the absence of pesticide continuing calibrations, all PQLs for the project method blank and samples are qualified "J" as estimated and usable for limited purposes.
- L.3 The laboratory raised the PQLS of the pesticide analytes to 0.02 ppb for all the samples due to biological interference.
- L.4 Due to sensitivity problems with methoxychlor in the initial calibration, the PQL of this analyte was raised by the reviewer to 0.5 ppb for the soil samples.

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DATA VALIDATION REPORT

PROGRAM:

POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)

LABORATORY:

Friedman & Bruya, Inc. (Seattle, WA)

REVIEWER:

Timothy Vonnahme

ANALYSIS:

Pesticides by USEPA Method 8080

MATRIX:

Water

DATE:

May 25, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (Seattle, WA) received 3 soil and 4 water samples from the Point Lay site on August 23, 1993 (referenced chain of custody record No. 537). Three of the water samples were requested for pesticide analysis by the pesticide organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for pesticides by USEPA Method 8080 on August 25, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	<u>Lab Sample No.</u>	<u>Matrix</u>
LAY-EB-01	446	Water
LAY-BKGD-SW01	457	Water
LAY-BKGD-SW02	462	Water

The following QC sample designations were included in project documentation: sample number LAY-EB-01 was designated as an equipment blank.

The Instrument Number-Sequence Date on the data summary form for water samples LAY-EB-01, LAY-BKGD-SW01, and LAY-BKGD-SW02 were inadvertently recorded by the laboratory as ICF5 08-25-93 instead of ICF6 08-23-93.

The quantitation limits reported by the laboratory for the water samples (2 ppb) were lower than those specified in the Project Sampling and Analysis Plan (2.5 ppb). Since the low point of the initial calibration is 0.01 ppm, the PQL should be 0.2 ppb. The PQLs have been corrected on the data summary forms by the reviewer.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document "National Functional Guidelines for Organic Data Review", December 1990, and the analytical guidelines in USEPA Method 8080, and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. <u>Technical Holding Times:</u>

A.1 The technical holding time QDCriteria were met for all project sample analyses.

B. <u>Initial Calibration:</u>

B.1 The laboratory performed a five point initial calibration on GC Instrument ICF6 on August 21, 1993. The range of the initial calibration was from 0.01 ppm to 1.0 ppm. Percent relative standard deviations (%RSDs) were calculated for all compounds using calibration factors determined from the initial calibration using the EC detector. The %RSDs for the following target analytes exceeded the recommended QC criteria of 20.0%

Compound	%RSD
Endosulfan II	38%
Endrin Aldehyde	31%
DDT/Endosulfan Sulfate	32%
Endrin Ketone	33%

Due to the large percent RSDs, the detected results for these compounds are qualified "J" as estimated and are usable for limited purposes.

B.2 Methoxychlor was spiked in at concentrations too low to be detected by the ECD detector until the 0.5 ppm initial calibration standard. All detected results for this analyte are qualified "R" as rejected and unusable, and the PQL is adjusted accordingly.

C. Continuing Calibration:

C.1 No continuing calibrations were analyzed during the sequence with the exception of the column degradation solution containing Endrin and DDT. The stability of the instrument, GC column, and detector were monitored using the Endrin and DDT column degradation solution and the Aroclor 1254 continuing calibration solution. These two solutions were used to check area consistency and surrogate area stability. It is the opinion of the reviewer, that since no pesticide continuing calibration solutions were analyzed, this is the only criteria that can be used to monitor system performance.

Due to the absence of pesticide continuing calibrations, the PQLs for all method blanks and samples are qualified "J" as estimated and usable for limited purposes.

D. <u>Laboratory Blanks:</u>

D.1 Target analytes were not detected in the method blank at a concentration

above the PQL and the results are considered acceptable.

E. <u>Instrument Blanks:</u>

E.1 Target analytes were not detected in the instrument blank at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

- F.1 Sample number LAY-EB-02 was designated as an equipment blank.
- F.2 Pesticide target analytes were not detected in the equipment blank at a concentration above the PQL and the results are considered acceptable.

G. Field Replicate Analyses:

G.1 There were no field replicates submitted for analyses with the pesticide fraction.

H. Surrogate Recoveries:

- H.1 A discrepancy exists between the surrogate recovery reported by the laboratory (80%) and the surrogate recovery calculated by the reviewer (166%) for project sample LAY-BKGD-SW02. The reviewer calculated the recovery of the surrogate using the reference area of the surrogate from the closest continuing calibration standard.
- H.2 All other surrogate recoveries met QC criteria and the results are considered acceptable.

I. Matrix Spike/Matrix Spike Duplicate:

I.1 No matrix spike and matrix spike duplicate analyses were performed for the pesticide fraction.

J. System Performance:

- J.1 The laboratory set up the GC analytical run time on the primary GC column to elute all pesticide analytes within 9 minutes, causing co-elution of numerous pesticides, and making identification difficult. A slower temperature program and/or slower carrier gas flow rate would increase resolution for many of the pesticide analytes.
- J.2 The Endrin and 4,4'-DDT breakdown met QC criteria and the results are considered acceptable.
- J.3 No other problems with system performance were observed for all other project sample analyses.

K. Quantitation and Identification:

- K.1 The laboratory reported incorrect PQLs for the project water samples. They have been corrected on the data summary form by the reviewer.
- K.2 Due to the absence of pesticide continuing calibrations, all PQLs for the project method blank and samples are qualified "J" as estimated and usable for limited purposes.

- K.3 The surrogate recovery for sample LAY-BKGD-SW02 exceeded the QC criteria on the high side as calculated by the reviewer. It is the opinion of the reviewer that the quality of the data was not affected.
- K.4 No other problems with compound quantitation and identification were observed.

- L.1 No target analytes were detected at a concentration above the PQLs in the method blank and the samples.
- L.2 The PQLs for the water samples have been adjusted on the data summary forms by the reviewer.
- L.3 Due to the absence of pesticide continuing calibrations, all PQLs for the project method blank and samples are qualified "J" as estimated and usable for limited purposes.

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DATA VALIDATION REPORT

PROGRAM:

POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)

LABORATORY:

Friedman & Bruya, Inc. (Seattle, WA)

REVIEWER:

Timothy Vonnahme

ANALYSIS:

Pesticides by USEPA Method 8080

MATRIX:

Soil

DATE:

June 3, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (Seattle, WA) received 15 soil samples from the Point Lay site on August 24, 1993 (referenced chain of custody record No. 542). Two of the samples were requested for pesticide analysis by the pesticide organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for pesticides by USEPA Method 8080 on August 26, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	<u>Matrix</u>
LAY-SS06-S03	640	Soil
LAY-SS06-S08	650	Soil

The quantitation limits reported by the laboratory for the soil samples (0.02 ppm) were lower than those specified in the Project Sampling and Analysis Plan (0.05 ppm). It is the opinion of the reviewer that the quality of the data was not affected.

The analytical results for the soil samples were reported with an adjustment for moisture content.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document "National Functional Guidelines for Organic Data Review", December 1990, and the analytical guidelines in USEPA Method 8080, and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. <u>Technical Holding Times:</u>

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:

B.1 The laboratory performed a five point initial calibration on GC instrument ICF5 on August 21, 1993. The range of the initial calibration was from 0.01 ppm to 1.0 ppm. The percent relative standard deviations (%RSDs) were calculated for all compounds using calibration factors determined from the initial calibration using the ECD detector. The %RSD for the following target analyte exceeded the recommended QC criteria of 20.0%

Compound	%RSD
beta-BHC	22%

All detected results for beta-BHC in the samples are qualified "J" as estimated and usable for limited purposes.

B.2 Methoxychlor was spiked in at concentrations too low to be detected by the ECD detector until the 0.5 ppm initial calibration standard. All detected results for this analyte are qualified "R" as rejected and unusable, and the PQL is adjusted accordingly.

C. Continuing Calibration:

C.1 No continuing calibrations were analyzed during the sequence with the exception of the column degradation solution containing Endrin and DDT. The stability of the instrument, GC column, and detector were monitored using the Endrin and DDT column degradation solution and the Aroclor 1254 continuing calibration solution. These two solutions were used to check area consistency and surrogate area stability. It is the opinion of the reviewer, that since no pesticide continuing calibration solutions were analyzed, this is the only criteria that can be used to monitor system performance.

Due to the absence of pesticide continuing calibrations, the practical quantitation limits (PQLs) for all method blanks and samples are qualified "J" as estimated and usable for limited purposes.

D. Laboratory Blanks:

D.1 The laboratory did not report the pesticide results for the method blank associated with this sample set. The reviewer modified the sample report summary form to included the pesticide results for the soil method blank. Target analytes were not detected in the method blank at a concentration above the PQL and the results are considered acceptable.

E. <u>Instrument Blanks:</u>

E.1 Target analytes were not detected in the instrument blank at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 There were no field blank analyses associated with this project sample set.

G. <u>Field Replicate Analyses:</u>

G.1 There were no field replicate samples submitted for analyses for the pesticide fraction.

H. Surrogate Recoveries:

H.1 All surrogate recoveries met QC criteria and the results are considered acceptable.

I. <u>Matrix Spike/Matrix Spike Duplicate:</u>

I.1 No matrix spike and matrix spike duplicate analyses were performed for the pesticide fraction.

J. System Performance:

- J.1 The laboratory set up the GC analytical run time on the primary GC column to elute all pesticide analytes within 9 minutes, causing co-elution of numerous pesticides and making identification difficult. A slower temperature program and/or slower carrier gas flow rate would increase resolution for many of the pesticide analytes.
- J.2 The Endrin and 4,4'-DDT breakdown met QC criteria and the results are considered acceptable.
- J.3 No other problems with system performance were observed for all other project sample analyses.

K. Quantitation and Identification:

- K.1 Due to the absence of pesticide continuing calibrations, all PQLs for the project method blank and samples are qualified "J" as estimated and usable for limited purposes.
- K.2 Due to biological interference present in all the samples, the PCLs have been raised to 0.02 ppb by the laboratory.
- K.3 Due to sensitivity problems with methoxychlor in the initial calibration, the PQL was raised by the reviewer to 0.5 ppb for the soil samples.
- K.4 The laboratory did not report the pesticide results for the method blank associated with this sample set. The reviewer modified the data summary form to included the pesticide results for the soil method blank. Target analytes were not detected in the method blank at a concentration above the PQL and the results are considered acceptable.
- K.5 No other problems with compound quantitation and identification were observed.

L. <u>Conclusion:</u>

L.1 No target analytes were detected at a concentration above the PQLs in the

method blank and the samples.

- L.2 Due to the absence of pesticide continuing calibrations, all PQLs for the project method blank and samples are qualified "J" as estimated and usable for limited purposes.
- L.3 The laboratory raised the PQLS of the pesticide analytes to 0.02 ppb for all the samples due to biological interference.
- L.4 Due to sensitivity problems with methoxychlor in the initial calibration, the PQL of this analyte was raised by the reviewer to 0.5 ppb for the soil samples.

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DATA VALIDATION REPORT

PROGRAM:

POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)

LABORATORY:

Friedman & Bruya, Inc. (Seattle, WA)

REVIEWER:

Clyde Hedin

ANALYSIS:

Polychlorinated Biphenyls (PCBs) by USEPA Method 8080.

MATRIX:

Water

DATE:

June 15, 1994

I. <u>INTRODUCTION:</u>

Friedman & Bruya, Inc. (Seattle, WA) received 11 water samples from the Point Lay site on August 24, 1993 (referenced chain of custody record No. 545). Nine of the samples were requested for PCB analysis by the PCB organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for PCBs by USEPA Method 8080 (GC/ECD) on August 27, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	<u>Matrix</u>
LAY-EB02	557	Water
LAY-LF01-SW01	559	Water
LAY-LF01-SW02	560	Water
LAY-LF01-SW03	561	Water
LAY-LF01-SW04	562	Water
LAY-LF01-SW05	563	Water
LAY-LF01-SW06	564	Water
LAY-LF01-SW07	565	Water
LAY-LF01-SW08	566	Water

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document "National Functional Guidelines for Organic Data Review", December 1990, and the analytical guidelines in USEPA Method 8080, and the Project Sampling and Analysis Plan.

The following QC sample designations were included in project documentation: sample numbers LAY-LF01-SW04 and LAY-LF01-SW08 were designated as field duplicates.

II. VALIDITY & COMMENTS:

A. <u>Technical Holding Times:</u>

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. <u>Initial Calibration:</u>

B.1 The laboratory performed a five point initial calibration on GC Instrument ICF5 on August 21, 1993. All samples were quantitated using a linear regression curve calculated from the initial calibration. The range of the initial calibration was from 0.1 ppm to 10 ppm. A percent relative standard deviation (%RSD) of 37.2% was calculated using calibration factors determined from the initial calibration. The %RSD of 37.2 exceeds the recommended method criteria of 20.0%, therefore, the detected results for PCBs in the project samples are qualified "J" as estimated and usable for limited purposes.

C. <u>Continuing Calibration:</u>

C.1 All QC criteria for the continuing calibrations were met and the results are considered acceptable.

D. <u>Laboratory Blanks:</u>

D.1 PCBs were not detected in the method blank at a concentration above the PQL and the results are considered acceptable.

E. Instrument Blanks:

E.1 PCBs were not detected in the instrument blanks at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 There were no field blanks submitted for analysis with this project sample set.

G. Field Duplicate Analyses:

- G.1 A QC limit for precision of \leq 20%, as measured by Relative Percent Difference (RPD) between water sample values, was specified for field duplicate comparability.
- G.2 Samples LAY-LF01-SW04 and LAY-LF01-SW08 were utilized for field duplicate analysis. The results of the field duplicate analyses, as reported by the laboratory, met all applicable QC criteria and the results are considered acceptable.

H. Surrogate Recoveries:

H.1 All surrogate recoveries met applicable QC criteria and the results are considered acceptable.

I. <u>Matrix Spike/Matrix Spike Duplicate:</u>

1.1 Tap water was used as the matrix spike/matrix spike duplicate sample.

I.2 All matrix spike/matrix spike duplicate met applicable QC criteria and the results are considered acceptable.

J. <u>System Performance:</u>

J.1 No problems with system performance were observed for the project sample analyses.

K. Quantitation and Identification:

K.1 No problems with compound quantitation and identification were observed for this project sample set.

- L.1 PCBs were not detected at concentrations above the PQL of the PCBs in the method blank and the samples.
- L.2 All data are considered valid and usable for all purposes.



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DATA VALIDATION REPORT

PROGRAM:

WAINWRIGHT / DEW Line RI/FS (ICF Project No. 41096-512-02)

LABORATORY:

Friedman & Bruya, Inc. (Seattle, WA)

REVIEWER:

Timethy Vennahme

ANIAL VOICE

Timothy Vonnahme

ANALYSIS:

Polychlorinated Biphenyls (PCBs) by USEPA Method 8080.

MATRIX:

Soil

DATE:

June 1, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (Seattle, WA) received 12 soil samples from the Point Lay site on August 23, 1993 (referenced chain of custody record No. 538) for PCB analysis by the PCB organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for PCBs by USEPA Method 8080 (GC/ECD) on August 24, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	<u>Matrix</u>
LAY-AOC5-S01	417	Soil
LAY-AOC5-S02	419	Soil
LAY-AOC5-S03	421	Soil
LAY-AOC5-S04	423	Soil
LAY-AOC5-S05	425	Soil
LAY-AOC5-S06	427	Soil
LAY-AOC5-S07	429	Soil
LAY-BKGD-SD01	431	Soil
LAY-BKGD-S01	433	Soil
LAY-BKGD-S02	435	Soil
LAY-BKGD-S03	437	Soil
LAY-BKGD-S04	439	Soil

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This

report was prepared in accordance with the USEPA draft document "National Functional Guidelines for Organic Data Review", December 1990, and the analytical guidelines in USEPA Method 8080, and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. <u>Technical Holding Times:</u>

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. <u>Initial Calibration:</u>

B.1 The laboratory performed a five point initial calibration on GC Instrument ICF5 on August 21, 1993. All samples were quantitated using a linear regression curve calculated from the initial calibration. The range of the initial calibration was from 0.1 ppm to 10 ppm. A percent relative standard deviation (%RSD) of 37.2% was calculated using calibration factors determined from the initial calibration. The %RSD of 37.2 exceeds the recommended method criteria of 20.0%, therefore, the detected results for PCBs in the project samples are qualified "J" as estimated and usable for limited purposes.

C. <u>Continuing Calibration:</u>

C.1 All QC criteria for the continuing calibrations were met and the results are considered acceptable.

D. <u>Laboratory Blanks:</u>

D.1 The laboratory reported a PQL for the PCBs of 0.5 ppm instead of 0.1 ppm for the method blank. The corrected PQLs were adjusted on the data summary form by the reviewer. PCBs were not detected in the method blank at a concentration above the PQL and the results are considered acceptable.

E. Instrument Blanks:

E.1 PCBs were not detected in the instrument blanks at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 There were no field blanks submitted for analysis with this project sample set.

G. Field Replicate Analyses:

- G.1 A QC limit for precision of \leq 50%, as measured by Relative Percent Difference (RPD) between soil sample values, was specified for field replicate comparability.
- G.2 Samples LAY-AOC5-S01 and LAY-AOC5-S07 were utilized for field replicate analysis. The results of the field replicate analyses, as reported by the laboratory, met all applicable QC criteria and the results are considered acceptable.

H. <u>Surrogate Recoveries:</u>

H.1 All surrogate recoveries met applicable QC criteria and the results are considered acceptable.

I. <u>Matrix Spike/Matrix Spike Duplicate:</u>

- I.1 Sample number LAY-AOC5-S06 was used as the matrix spike/matrix spike duplicate sample.
- I.2 All matrix spike/matrix spike duplicate met applicable QC criteria and the results are considered acceptable.

J. System Performance:

J.1 No problems with system performance were observed for the project sample analyses.

K. Quantitation and Identification:

- K.1 The PQL for the PCBs in the method blank and LAY-AOC5-S06 DUP were reported incorrectly at 0.5 ppm by the laboratory. They have been adjusted to 0.1 ppm on the data summary form by the reviewer.
- K.2 The PQL for the PCBs in samples, LAY-BKGD-S02 and LAY-BKGD-S03 were reported incorrectly at 0.1 ppm by the laboratory due to failure to incorporate the percent moisture calculation into the PQL result of the samples. They have been adjusted to 0.2 ppm on the data summary form by the reviewer.
- K.3 No other problems with compound quantitation and identification were observed for this project sample set.

L. Conclusion:

- L.1 PCBs were not detected at a concentration above the PQL of the PCBs in the method blank and the samples.
- L.2 The laboratory reported incorrect PQLs for the method blank, LAY-AOC5-S06 DUP, and samples LAY-BKGD-S02 and LAY-BKGD-S03. They have been adjusted on the data summary forms by the reviewer.
- L.3 All other data are considered valid and usable for all purposes.

ICF KAISER ENGINEERS, INC. 2700 CHANDLER AVENUE, BUILDING C LAS VEGAS, NV 89120 702/795-0515

DATA VALIDATION REPORT

PROGRAM:

POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)

LABORATORY:

Friedman & Bruya, Inc. (Seattle, WA)

REVIEWER:

Timothy Vonnahme

ANALYSIS:

Polychlorinated Biphenyls (PCBs) by USEPA Method 8080.

MATRIX:

Water and Soil

DATE:

May 25, 1994

I. INTRODUCTION:

Friedman & Bruya, Inc. (Seattle, WA) received 3 soil and 4 water samples from the Point Lay site on August 23, 1993 (referenced chain of custody record No. 537). Six of the samples were requested for polychlorinated biphenyls (PCBs) analysis by the PCB organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for PCBs by USEPA Method 8080 (GC/ECD) on August 24 and August 25, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	<u>Lab Sample No.</u>	<u>Matrix</u>
LAY-EB-01	446	Water
LAY-BKGD-SW01	457	Water
LAY-BKGD-SW02	462	Water
LAY-AOC5-SD01	463	Soil
LAY-AOC5-SD02	465	Soil
LAY-AOC5-SD03	467	Soil

The following QC sample designations were included in project documentation: sample number LAY-EB-01 was designated as an equipment blank.

The analytical results for the soil samples were reported with an adjustment for moisture content.

The Instrument Number-Sequence Date on the data summary form for water samples LAY-EB-01, LAY-BKGD-SW01, and LAY-BKGD-SW02 were inadvertently recorded by the laboratory as ICF5 08-25-93 instead of ICF6 08-23-93.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document "National Functional Guidelines for Organic Data Review", December 1990, and the analytical guidelines in USEPA Method 8080, and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. <u>Technical Holding Times:</u>

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. Initial Calibration:

- B.1 The laboratory performed a five point initial calibration on GC Instrument ICF5 on August 21, 1993. All samples were quantitated using a linear regression curve calculated from the initial calibration. The range of the initial calibration was from 0.1 ppm to 10 ppm. A percent relative standard deviation (%RSD) of 37.2% was calculated using calibration factors determined from the initial calibration. The %RSD of 37.2 exceeds the recommended method criteria of 20.0%, therefore, the detected results for PCBs in the project soil samples are qualified "J" as estimated and usable for limited purposes.
- B.2 The laboratory performed a five point initial calibration on GC instrument ICF6 on August 21, 1994. The range of the initial calibration was from 0.1 ppm to 10 ppm. All samples were quantitated using a linear regression curve calculated from the initial calibration. A percent relative standard deviation (%RSD) of 30.3% was calculated using calibration factors determined from the initial calibration. The %RSD of 30.3 exceeds the recommended method criteria of 20.0%, therefore, the detected results for PCBs in the project water samples are qualified "J" as estimated and usable for limited purposes.

C. <u>Continuing Calibration:</u>

C.1 All QC criteria for the continuing calibrations from both instruments were met and the results are considered acceptable.

D. Laboratory Blanks:

D.1 PCBs were not detected in the method blanks at a concentration above the PQL and the results are considered acceptable.

E. Instrument Blanks:

E.1 PCBs were not detected in the instrument blanks at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 Sample number LAY-EB-02 was designated as an equipment blank.

- F.2 PCBs were not detected in the equipment blank at a concentration above the PQL and the results are considered acceptable.
- G. Field Replicate Analyses:
 G.1 There were no field replicate samples associated with this project sample set.
- H. Surrogate Recoveries:

 H.1 All surrogate recoveries met applicable QC criteria and the results are considered acceptable.
- I. Matrix Spike/Matrix Spike Duplicate:
 I.1 Sample number LAY-AOC5-S06 was used for the soil matrix spike/matrix spike duplicate analyses. The sample was not included on chain-of-custody 537.
 - 1.2 All matrix spike/matrix spike duplicate QC criteria were met and the results are considered acceptable.
- J. System Performance:
 J.1 No problems with system performance were observed for the project sample analyses.
- K. <u>Quantitation and Identification:</u>
 K.1 The laboratory did not report the correct PQLs for the soil method blank and samples. The PQLs have been adjusted on the data summary forms by the reviewer.
 - K.2 The Instrument Number-Sequence Date on the data summary form for water samples LAY-EB-01, LAY-BKGD-SW01, and LAY-BKGD-SW02 were inadvertently recorded by the laboratory as ICF5 08-25-93 instead of ICF6 08-23-93.
 - K.3 No other problems with compound quantitation and identification were observed for this project sample set.
- L. Conclusion:

 L.1 PCBs were not detected at a concentration above the PQL in the method blanks and the samples.
 - L.2 The PQL for the PCBs in the soil method blank and the samples have been adjusted on the data summary form by the reviewer.
 - L.3 All other data are considered valid and usable for all purposes.

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DATA VALIDATION REPORT

PROGRAM:

POINT LAY / DEW Line RI/FS (ICF Project No. 41096-512-02)

LABORATORY:

Friedman & Bruya, Inc. (Seattle, WA)

REVIEWER:

Timothy Vonnahme

ANALYSIS:

Polychlorinated Biphenyls (PCBs) by USEPA Method 8080.

MATRIX:

Soil

DATE:

June 14, 1994

I. <u>INTRODUCTION:</u>

Friedman & Bruya, Inc. (Seattle, WA) received 15 soil samples from the Point Lay site on August 24, 1993 (referenced chain of custody record No. 542). Eleven of the samples were requested for PCB analysis by the PCB organics extraction method described in Section 8 of the Project Sampling and Analysis Plan. The samples were analyzed for PCBs by USEPA Method 8080 (GC/ECD) on August 26, 1993.

The ICF site identification numbers and corresponding FBI laboratory sample identification numbers are listed below.

ICF Site No.	Lab Sample No.	<u>Matrix</u>
LAY-SS06-S01	636	Soil
LAY-SS06-S02	638	Soil
LAY-SS06-S03	640	Soil
LAY-SS06-S04	642	Soil
LAY-SS06-S05	644	Soil
LAY-SS06-S06	646	Soil
LAY-SS06-S07	648	Soil
LAY-SS06-S08	650	Soil
LAY-SS06-S09	652	Soil
LAY-SS06-S10	654	Soil
LAY-SS06-S11	656	Soil

The following QC sample designation was included in project documentation: sample numbers LAY-SS06-S09 and LAY-SS06-S01 were designated as field replicates, and sample numbers LAY-SS06-S07 and LAY-SS06-S10 were also designated as field replicates.

The analytical results for the soil samples were reported with an adjustment for moisture content.

The analytical results with qualifications are presented on modified sample data sheets submitted by the laboratory. Definitions of the data qualifiers are listed in Table 1B. This report was prepared in accordance with the USEPA draft document "National Functional Guidelines for Organic Data Review", December 1990, and the analytical guidelines in USEPA Method 8080, and the Project Sampling and Analysis Plan.

II. VALIDITY & COMMENTS:

A. Technical Holding Times:

A.1 The technical holding time QC criteria were met for all project sample analyses.

B. <u>Initial Calibration:</u>

B.1 The laboratory performed a five point initial calibration on GC Instrument ICF5 on August 21, 1993. All samples were quantitated using a linear regression curve calculated from the initial calibration. The range of the initial calibration was from 0.1 ppm to 10 ppm. A percent relative standard deviation (%RSD) of 37.2% was calculated using calibration factors determined from the initial calibration. The %RSD of 37.2 exceeds the recommended method criteria of 20.0%, therefore, the detected results for PCBs in the project samples are qualified "J" as estimated and usable for limited purposes.

C. Continuing Calibration:

C.1 All QC criteria for the continuing calibrations were met and the results are considered acceptable.

D. Laboratory Blanks:

D.1 The laboratory reported a water PQL for the PCBs of 10 ppb instead of 0.1 ppm for the soil method blank. The corrected PQLs were adjusted on the data summary form by the reviewer. PCBs were not detected in the method blank at a concentration above the PQL and the results are considered acceptable.

E. Instrument Blanks:

E.1 PCBs were not detected in the instrument blanks at a concentration above the PQL and the results are considered acceptable.

F. Field Blanks:

F.1 There were no field blanks submitted for analysis with this project sample set.

G. Field Replicate Analyses:

G.1 A QC limit for precision of \leq 50%, as measured by Relative Percent Difference (RPD) between soil sample values, was specified for field replicate

comparability.

- G.2 Sample numbers LAY-SS06-S09 and LAY-SS06-S01 were utilized for field replicate analysis. The results of the field replicate analyses met all applicable QC criteria and the results are considered acceptable.
- G.3 Sample numbers LAY-SS06-S07 and LAY-SS06-S10 were also utilized for field replicate analysis. The results of the field replicate analyses met all applicable QC criteria and the results are considered acceptable.

H. <u>Surrogate Recoveries:</u>

- H.1 The laboratory did not report a surrogate recovery for sample LAY-SS06-S10, but was calculated as 74% by the reviewer. The corrected result has been adjusted on the data summary form by the reviewer.
- H.2 The laboratory surrogate recoveries of 220% for sample LAY-SS06-S09 and 160% for sample LAY-SS06-S11. These same recoveries when calculated by the reviewer were 134% and 99% respectively.
- H.3 All surrogate recoveries met applicable QC criteria and the results are considered acceptable.

I. <u>Matrix Spike/Matrix Spike Duplicate:</u>

- 1.1 Sample number LAY-SS06-S07 was used as the matrix spike/matrix spike duplicate sample.
- 1.2 All matrix spike/matrix spike duplicate met applicable QC criteria and the results are considered acceptable.

J. System Performance:

J.1 No problems with system performance were observed for the project sample analyses.

K. Quantitation and Identification:

- K.1 The laboratory reported a water method blank with PQLs of 10 ppb. It has been corrected on the data summary forms by the reviewer.
- K.2 The PQL for the PCBs in samples LAY-SS06-S01, LAY-SS06-S02, and LAY-SS06-S09 was raised to 0.5 ppm on the data summary forms by the reviewer due to interference present in the samples. The PQL for the PCBs in sample LAY-SS06-S08 was raised to 0.2 ppm due to interference present in the sample, and the PQL for the PCBs in sample LAY-SS06-S06 was also raised to 0.2 ppm by the reviewer due to a moisture content of 49% that was not incorporated into the PQL calculation of the PCBs by the laboratory.
- K.3 The laboratory did not report a surrogate recovery for sample LAY-SS06-S10, but was calculated as 74% by the reviewer. The corrected result has been adjusted

on the data summary form by the reviewer. The laboratory surrogate recoveries of 220% for sample LAY-SS06-S09 and 160% for sample LAY-SS06-S11. These same recoveries when calculated by the reviewer were 134% and 99% respectively.

K.4 No other problems with compound quantitation and identification were observed for this project sample set.

- L.1 PCBs were not detected at a concentration above the PQL of the PCBs in the method blank and the samples.
- L.2 The reviewer raised the PQL on the data summary forms for the PCBs in samples LAY-SS06-S01, LAY-SS06-S02, and LAY-SS06-S09, LAY-SS06-S08 due to interference present in the samples.
- L.3 The reviewer raised the PQL on the data summary form for sample LAY-SS06-S06 because the moisture content of the sample was not included in the PQL calculation.
- L.4 All other data are considered valid and usable for all purposes.